NAiS

Programmable Display

GT01
Technical Manual

■ **Applicable Product**

• GT01

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Programmable Display GT01 Technical Manual
ARCT1F381E ’03.4

SAFETY PRECAUTIONS
[ALWAYS OBSERVE THESE PRECAUTIONS]

Before installing, operating, servicing or inspecting this product, please make sure you have read this manual and the explanations of how procedures are carried out, and make sure the product is used correctly.

This manual uses two safety standard levels: “WARNING” and “CAUTION”.

WARNING

Erroneous handling of an item marked with this label can cause fatal or critical injury to the user.

- **If this product is used in applications where accidents involving bodily injury and/or significant damage may be conceivable, measures should be taken to ensure adequate safety, such as the use of duplicate safety mechanisms.**
- **The functions of the GT main unit should not be used to design systems which may pose a threat to human life or which may cause severe injury or damage. Designs should include safety mechanisms for use in the event that switch functions do not function correctly.**
- **Do not use this product in an environment where combustible gases are present. This can cause explosion.**
- **Do not dispose of it by incineration. This can cause it to explode.**

CAUTION

Erroneous handling of an item marked with this label can cause injury to the user, or physical damage to property.

- **This product should not be used outside of the stated specifications ranges for ratings, service life, configuration factors and other elements. This can cause abnormal generation of heat and smoke.**
- **The operational force of the touch panel should be kept to 0.98 N or lower. Operating the touch panel at a higher force could cause damage.**
- **Never touch terminals while the power supply is on. This can cause electric shock.**
- **Never disassemble or alter this product. This can cause electric shock and smoke generation.**

How This Manual Is Configured

GT series Main Unit

Before Using the GT series
This section describes items that should be confirmed and precautions that should be observed before the GT series are used.

Chapter 1. Specifications
This chapter contains the names and specifications of the various parts of the GT series, as well as a table of functions, wiring diagrams, and dimensions.

Chapter 2. Installation and Wiring
This chapter explains how the GT series should be installed and how wiring should be connected.

Chapter 3. Setup
This chapter describes the setup procedures necessary when using the GT series for the first time.

Chapter 4. Connecting and Communicating with the PLC
This chapter explains how to connect the GT series to the PLC and the FP series by Matsushita, and how to set up communications between the units.

Chapter 5. GT series Configuration Settings
This chapter describes the configuration settings for the GT series, and how they should be entered.

Chapter 6. Using the Various Functions
Functions such as switching GT series screens, backlighting, and buzzer control are explained here.

Chapter 7. Servicing and Maintenance
This chapter describes servicing and maintenance procedures for the GT series, as well as how optional items are handled.

Chapter 8. Troubleshooting
This explains what to do if there appears to be something wrong with the GT series, or an error occurs.

Chapter 9. Documentation
This section includes BIN/HEX/BCD code correspondence tables, ASCII code tables, cable specifications, and other information.

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Before Using the GT

This section describes items that should be confirmed and precautions that should be observed before the GT series is used. Make sure you read this section before using the GT series.

GT Series Usage Procedures

If you are using the GT series for the first time, please follow the procedure outlined below.

Procedure For Using the GT series

1. Confirm the items included with the product. ☛ page xi

Please confirm that all of the items have been included with the product you have purchased. Products are carefully checked before being shipped, but if you do find anything missing, please contact your dealer.

2. Install and wire the main unit. ☛ page 13

Install the main unit, and connect the power supply, PLC connection cable and other wiring. When installing and wiring the product, carefully read the explanation on pages 13 to 15 concerning the installation environment, and make sure the product is installed correctly, in an appropriate environment. For information on connecting the product to the FP series PLC, and on entering communications settings, please see page 29 and subsequent pages.

3. Set up the main unit. ☛ page 21

When the product is shipped from the factory, it is set up with specifications that enable connection to the FP series PLC. If you plan to use the product without changing these settings, no setup is required, but if you plan to change the settings, you will need to follow the setup procedure outlined on page 21 and subsequent pages. Particularly with regard to the basic communication area to the PLC and other devices, please confirm the settings carefully and change only those that are necessary.

J **Main cases in which setup is necessary**

- When the device being connected is a general-purpose serial device (such as a computer or microcomputer board)
- When the basic communication area for the device is different from that set when the product is shipped

4. Check communication with the external device (PLC, etc.). ☛ page 30

Check the connections and communication with the external device. Connections and communication with devices in the FP series PLC vary depending on the device, so check the information on page 30 and subsequent pages.

5. Enter the operating environment settings. ☛ page 39

In addition to the setup described at step 4, various detailed settings can be entered for the GT01 operating environment. Enter any necessary operating environment settings, referring to page 39 and subsequent pages.

6. Install the screen creation tool.

Install the Terminal GTWIN screen creation tool in the personal computer.

7. Create the screen contents.

Create the screen contents using the Terminal GTWIN screen creation tool, and send the screen to the GT main unit. For information on creating screens and on operating GTWIN, please refer to the Help function that comes with GTWIN.

8. Test the operation.

Connect the GT main unit containing the screen data to an external device (PLC or general-purpose serial device), and check the operation contents.

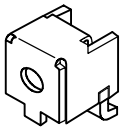
Confirming the Package Contents

Check to make sure the necessary items have been included with the product you have purchased.

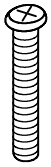
Items Included with the GT01 (AIGT0030B1, AIGT0030H1)

Main unit

Set of attachment fittings



Attachment fittings x 4



Attachment screws x 4

Waterproof packing

One piece of waterproof packing has been attached to unit.

The following maintenance part is available: AIGT081 (10 piece set)

Installation instructions

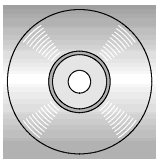
Please read these instructions carefully before using the product.

◆ CAUTION

- **There is a film over the front panel protective sheet. Remove this film when using the unit. For instructions on removing the film, see page 71.**
- **Front panel protective sheets for replacement are available as a separate purchase (AIGT083). Please see page xv.**
- **Waterproof packings for replacement are available as a separate purchase (AIGT081). Please see page xv.**

Items Included with the Terminal GTWIN English-language version (AIGT8001V2)

Terminal GTWIN CD-ROM

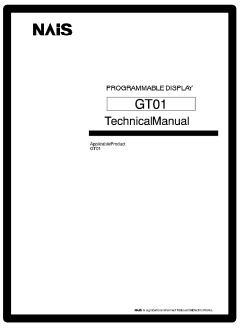


Software usage license agreement and user card

Read the “Software usage license agreement” carefully, and fill in the user card. Please return the user card to Matsushita.

GT10/GT30 Technical Manual

GT01 Technical Manual



This is the manual you are currently reading. It contains instructions on installing and booting GTWIN. Please read it carefully before using your product.

◆ CAUTION

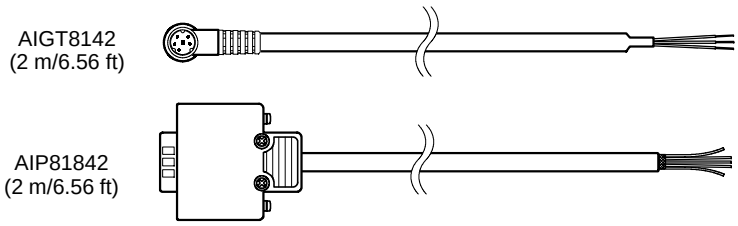
About the software usage license agreement and user card

- **Before using GTWIN, read the “Software usage license agreement” carefully.**
- **The license agreement comes as a set with the user card. Fill in the user card, and return it to Matsushita. The user card is necessary in order to obtain support services such as future version upgrades and technical support. Don’t forget to return the card in order to be eligible for such services.**
- **The serial number needed in order to install GTWIN is found on the user card. Please make a copy of it before returning the card, and keep it in a safe place.**

Items Included With the PLC Connection Cable (AIGT8142 / AIP81842)

Cable

One of the following two cables has been included with the product you have purchased.



Wiring diagram

The package includes a diagram that shows the internal wiring of the cables pictured above.

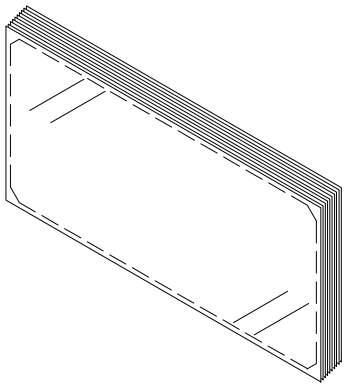
◆ **REFERENCE**

For information on connecting and wiring the cables shown above and the PLC, please refer to Chapter 4, “Connecting and Communicating with the PLC”.

Items Included with the Front Panel Protective Sheet (AIGT080)

Front panel protective sheet

Optional protective sheets are available to protect and keep the GT series touch panel clean. Please use if you wish to protect the front panel from dirt and prevent degradation.



Installation instructions

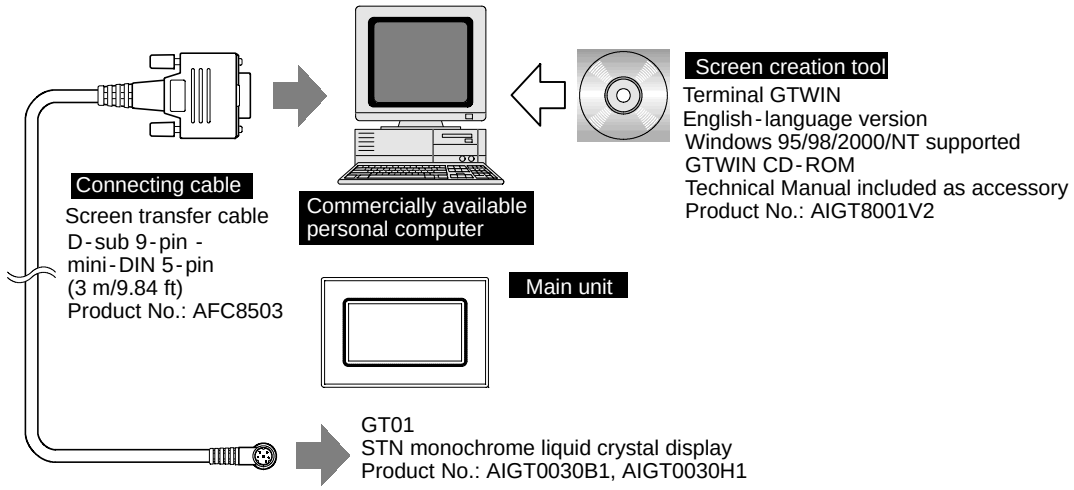
Please read these instructions carefully before installing the product.

◆ **REFERENCE**

For information on replacing the front panel protective sheet, please refer to page 71.

GT Series System Configuration

The following devices are necessary in order to use the GT series.



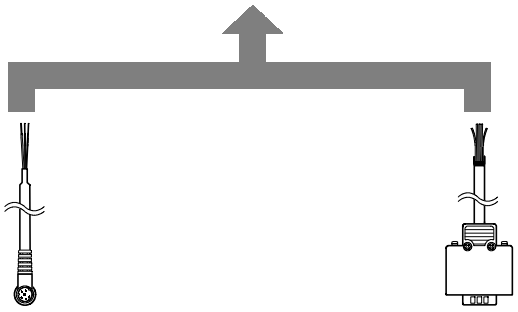
Screen creation tool
Terminal GTWIN
English-language version
Windows 95/98/2000/NT supported
GTWIN CD-ROM
Technical Manual included as accessory
Product No.: AIGT8001V2

Connecting cable
Screen transfer cable
D-sub 9-pin - mini-DIN 5-pin
(3 m/9.84 ft)
Product No.: AFC8503

Commercially available personal computer

Main unit

GT01
STN monochrome liquid crystal display
Product No.: AIGT0030B1, AIGT0030H1



Communication cable

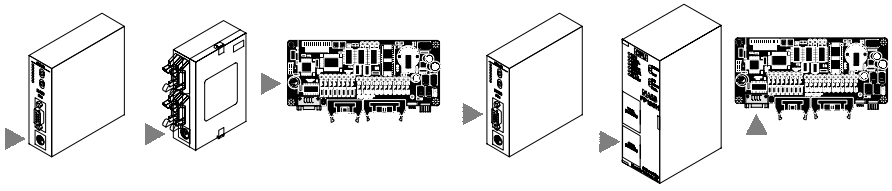
PLC connecting cable (1)
For connection to TOOL port of FP0 / FP2 / FP2SH / FP-M
Mini-DIN 5-pin loose-wire cable
(2 m/6.56 ft)
Product No.: AIGT8192

Connecting to the TOOL port of the FP0 / FP2 / FP2SH / FP-M

Communication cable

PLC connecting cable (2)
For connection to COM. port of FP1 / FP2 / FP2SH / FP-M / FP10SH, TOOL port of FP10SH, and computer communication unit of FP2 / FP3
D-sub 9-pin loose-wire cable (2 m/6.56 ft)
Product No.: AIP81842

Connecting to the COM. port of FP1 / FP2 / FP2SH / FP-M / FP10SH and computer communication unit of FP2/FP3



◆ CAUTION

Connecting to the COM. port of the PLC
Because connecting the unit to the COM. port of the FPΣ/FP0 requires a loose-wire connection, this cable is not available.

Products for the GT Series

Products types

Item Name	Contents		Product No.
GT01 main unit	Programmable display unit main unit	RS232C, Black (Charcoal gray)	AIGT0030B1
		RS232C, ashgray	AIGT0030H1
Terminal GTWIN English-language version	- "Terminal GTWIN" English-language screen creation tool (CD-ROM) - Set of GT01 Technical manuals (English)		AIGT8001V2
Screen transfer cable	Cable for transferring data between GTWIN and GT (3 m/9.84 ft)		AFC8503
PLC connecting cable (1)	For connection to TOOL port of FP0 / FPΣ / FP2 / FP2SH / FP-M Mini-DIN 5-pin loose-wire cable (2 m/6.56 ft)		AIGT8142
PLC connecting cable (2)	For connection to COM. port of FP10SH, and other PLC COM. port D-sub 9-pin loose-wire cable (2 m/6.56 ft)		AIP81842
Front panel protective sheet	Front panel protective sheet for GT01 (for replacement). Ten in set. * 1 sheet included with GT01 when shipped.		AIGT080

◆ CAUTION

- **Connecting to the COM. port of the FP0**
  Because connecting the unit to the COM. port of the FPΣ/FP0 requires a loose-wire connection, this cable is not available.
- **About the manual packed with the Terminal GTWIN English-language version**
  The manual you are currently reading is included as an accessory with the Terminal GTWIN English-language version. This manual contains information only on procedures such as installing GTWIN. For detailed information on operating GTWIN, please refer to the Help function in the software.

An Overview of GT01 Functions

3 colors can be displayed, to reflect the status

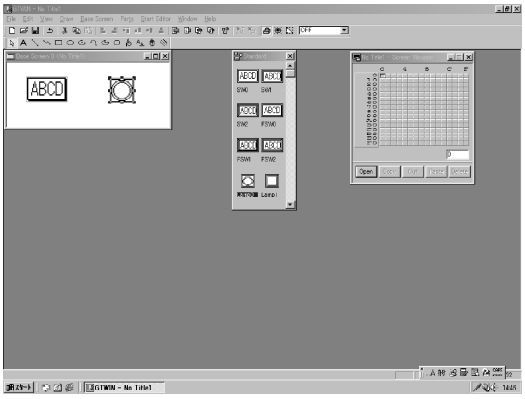
Various messages and graphics can be displayed on the liquid crystal display screen, which measures 128 x 64 dots, as well as lamps, internal PLC data, graphs, clocks, and other information. In addition, backlighting is available in three colors, green, orange, and red, so that information can be color-coded. This makes it easy to grasp information at a glance.

Analog touch panel provided

GT01 comes with a compact touch panel. Switches and a keyboard can be laid out, so operation is possible by simply touching the screen. Since this is an analog touch panel, the freedom with which you can change the size of and layout switches is greater than that possible with digital switches.

Screens can be created easily, using special tools

Screen contents can be easily created using the dedicated Terminal GTWIN tool (runs on Windows 95/98/2000/NT/XP). Screens are put together simply by selecting parts from a library and positioning them in place.

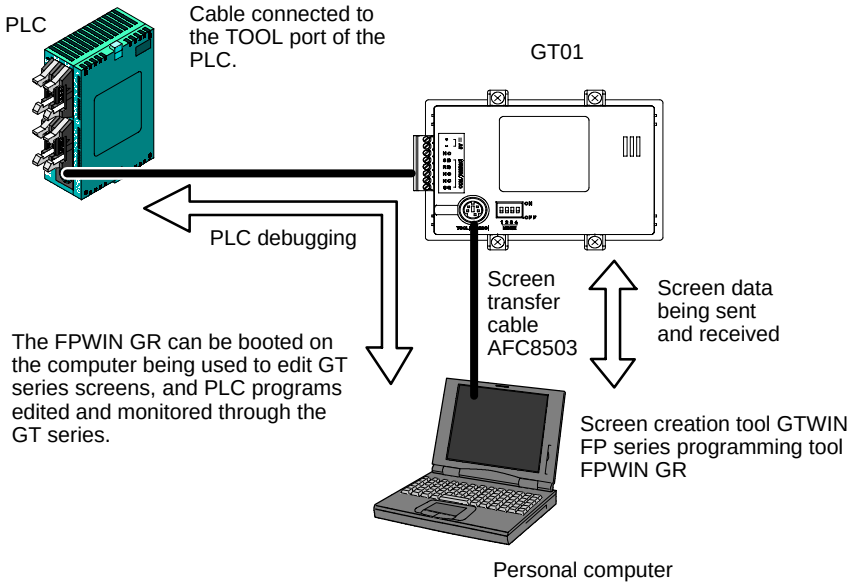


Ultra-thin body is only 24 mm/0.94 inch deep

The in-panel depth is a mere 24 mm/0.94 inch (including the fittings), configuring an ultra-thin body and taking up a bare minimum of space.

Through function is convenient for debugging

If connections are made as shown in the diagram, a convenient “through” function makes it possible to transfer data from the GT01 and carry out PLC debugging at the same time that communication is going on between the GT01 and the FP series PLC. This significantly boosts efficiency in the workplace.


PLC
Cable connected to the TOOL port of the PLC.
GT01
PLC debugging
Screen transfer cable AFC8503
Screen data being sent and received
The FPWIN GR can be booted on the computer being used to edit GT series screens, and PLC programs edited and monitored through the GT series.
Screen creation tool GTWIN FP series programming tool FPWIN GR
Personal computer

Maintenance is easier than ever before

LEDs are used for the backlight. This eliminates the need for troublesome replacement. Also, screen data is saved to F-ROM and batteries are not used. (There is no clock function.) You may safely use the GT01 for a very long time.

Chapter 1

Specifications

1.1 GT01 Specifications

1.1.1 General Specifications

Item	GT01 specifications
Rated voltage	5 V DC
Operating voltage range	4.5 to 5.5 V DC
Power consumption	1 W max.
Ambient temperature	0°C to 50°C/32°F to 122°F (5 V DC max. if installed horizontally)
Ambient humidity	20% RH to 85% RH (non condensing)
Storage temperature	-20°C to 60°C/-4°F to 140°F
Storage humidity	10% RH to 85% RH (non condensing)
Vibration resistance	10Hz to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes
Shock resistance	98 m/s^2 min., 4 times on 3 axes
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.
Mass	Approx. 160 g/5.644 oz

1.1.2 Display

Item	GT01 specifications
Display	STN monochrome LCD
Resolution	128 (W) x 64 (H) dots
Display color	2 colors (black/white)
Displayable area	78.5 (W) x 37.1 (H) mm 3.09 (W) inch x 1.46 (H) inch
Backlight	3-color LED backlight (green, red, orange)

1.1.3 Functions

Item	GT01 specifications
Displayable fonts	Fixed fonts: 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Half width and full width characters can be displayed at same width, doubled width, or quadrupled width True Type fonts
Character types	Alphanumeric characters
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps
Number of screens	Screen numbers that can be set: Base screens No. 00 to FF (HEX) Number of screens that can be registered varies depending on registered contents. No. of parts that can be registered for one screen: 256 (Note: this includes the number of message part replacements.)
Part functions	Messages, lamps, switches, data, bar graphs, clocks, keyboard
Contrast adjustment	Contrast can be adjusted using touch panel operation
Automatic communication settings	Settings for communication between dedicated software and PLC set automatically by connecting cable
Debugging functions	Through function (PLC can be debugged from personal computer by connecting computer to TOOL port and PLC to COM. port)
Screen creation	Dedicated software Terminal GTWIN used. Applicable OS: Windows 95/98/2000/NT/XP

* Clock functions are not available.

1.1.4 Touch Key

Item	GT01 specifications
Touch key	Analog touch key
Touch key operation	0.5 N max.
Touch key life	Min. 10^6

1.1.5 Memory (1)

Screen data and GTWIN Configuration Settings data

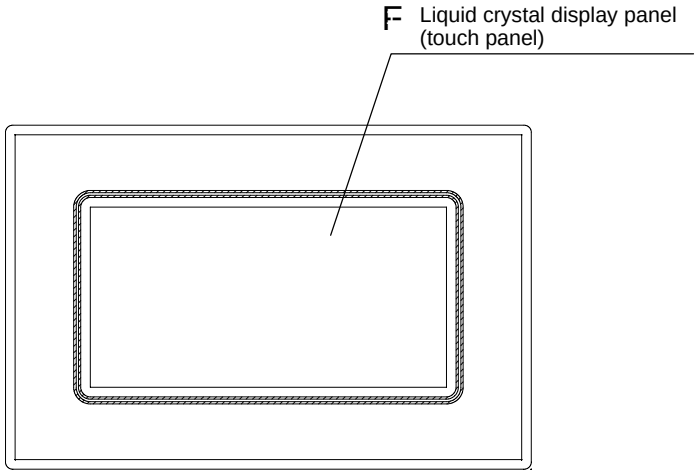
Item	GT01 specifications
Memory type	F-ROM
Memory capacity	384 kbytes

1.1.6 Interface

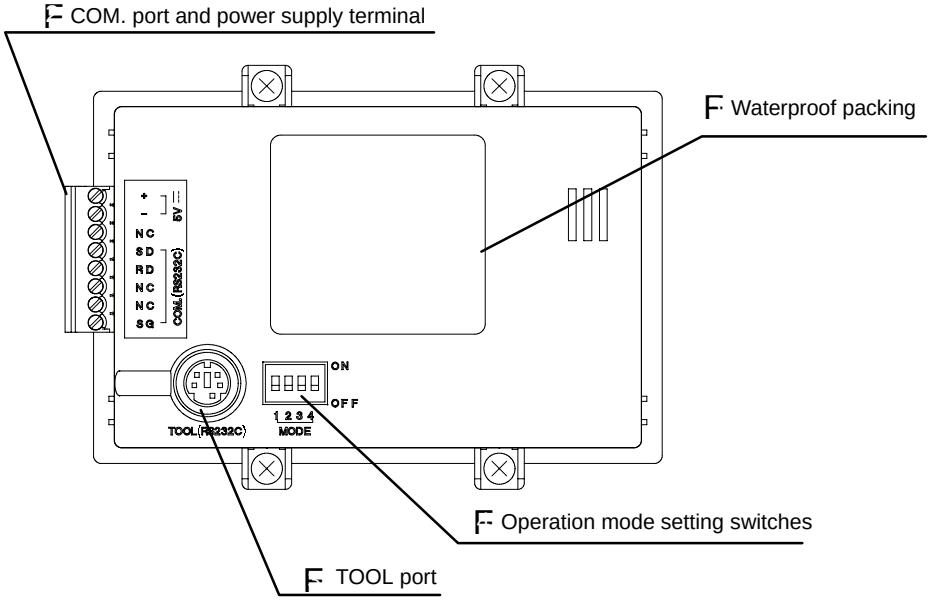
Item		GT01 specifications
COM. Port	Communications ratings	Conforms to RS232C
	Conditions for communications with external devices	Baud rate: 9600, 19200, 38400, 57600, 115200 bits/s
		Data bits: 7 or 8 bits Parity: None, Odd, Even Stop bits: 1 bit
	Protocol	FP series supported/general-purpose RS232C supported
	Connector	Connector terminal base (8-pin)
TOOL port	Communications ratings	Conforms to RS232C
	Conditions for communications with external devices	Baud rate: 9600, 19200, 115200 bits/s Data bits: 8 bits Parity: None, Odd, Even Stop bits: 1 bit
	Protocol	Dedicated protocol
	Connector	Mini-DIN (5-pin)

1.2 GT01 Names and Functions of Parts

1.2.1 GT01 (front)



1.2.2 GT01 (rear)



1.2.3 Names and Functions of Parts

(1) Liquid crystal display panel / touch panel

Various screens are displayed here. A touch panel is provided on the liquid crystal display panel, and switches can be operated and data entered simply by touching the panel.

Optional protective sheets are also available to protect the touch panel and keep it clean. (A sheet is affixed to the touch panel to protect it from scratches when shipping. Please remove it before using the GT01.)

(2) COM. port (PLC/external device connection port) and power supply terminal

This is an RS232C port for connecting to a PLC, host PC, or microcomputer board, and a 5 V DC operation power supply terminal. (The GT01 is shipped with one communications connector.)

(3) TOOL port (GTWIN connection port)

This port is used to connect a personal computer in which the screen creation tool GTWIN has been installed, using a dedicated cable (AFC8503).

(4) Operation mode setting switches

With the GT01, screen data and configuration settings data are stored in an internal F-ROM, so no battery backup is needed.

The operation mode setting switch has a switch that prohibits access to the System Menu.

Operation mode setting switches

(settings when shipped)

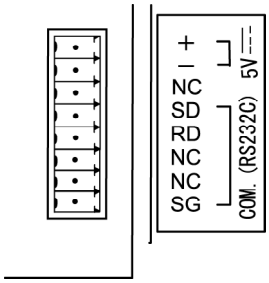
Switch no.	Function	OFF	ON
1	Usage inhibited	Should always be in the OFF position when unit is used	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the OFF position when unit is used	
4			

(5) Waterproof packing

This assures that the front panel is waterproof. One piece is provided as an accessory when the unit is shipped.

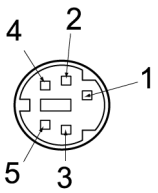
1.3 Internal Wiring Connections for Ports

1.3.1 COM. Port



Wiring and cables should be laid out in such a way that cables are not affected by external noise. Also, shielded wiring should be used for cables.

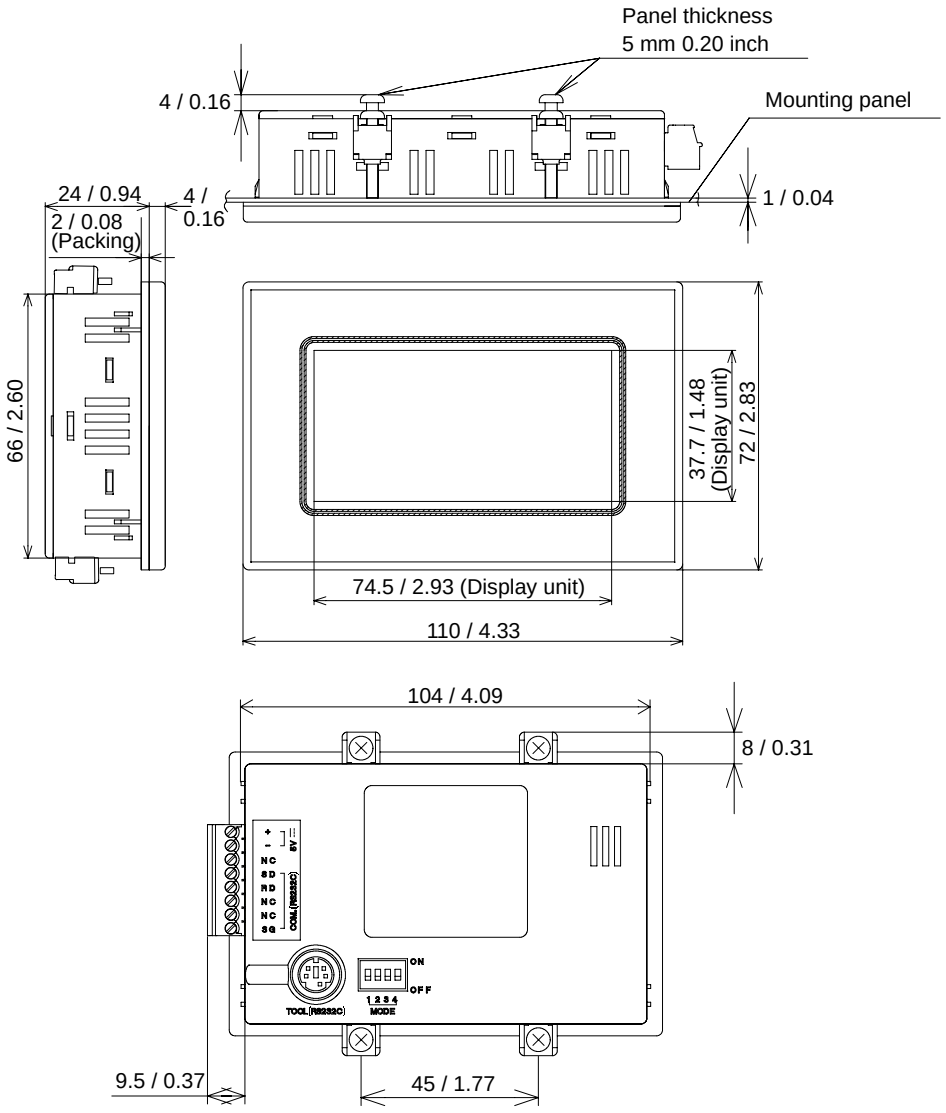
1.3.2 TOOL Port



Pin No.	Contents
1	SG
2	SD
3	RD
4	N.C.
5	N.C.

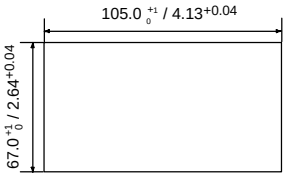
1.4 Dimensions

1.4.1 GT01 Dimensions



1.4.2 GT01 Panel Cutout Dimensions

The panel cutout dimensions of the GT01 are as shown below.



Applicable panel thickness:
1.0mm to 5.0mm
0.04inch to 0.20inch

*During installation when there will be other parts installed to the panel and wiring performed, we recommend that you provide a 30 to 50 mm clearance around the GT01 as a precaution against potential cable damage and to improve work efficiency when performing the installation.

Caution 1: Be absolutely sure not to seal the slits on the GT01.

Chapter 2

Installation and Wiring

2.1 Installation

2.1.1 Installation Environment

When installing and using the GT series, always make sure the following conditions are observed.

Usage Conditions

When installing the product, make sure it is used within the range of the general specifications. Do not use in the following environments:

- Areas where the unit may come in contact with water (the unit is warranted by IP65 for the installed panel, but this applies to initial values and operation cannot be guaranteed in areas where the unit is constantly subjected to water or to extreme temperatures or humidity).
- Areas where the ambient temperature exceeds the range 0°C to 50°C/32°F to 122°F.
- Areas where the ambient humidity exceeds 20% RH to 85% RH.
- If the control panel and other parts are installed in an environment where the air tends to be poorly ventilated, forced cooling should be used to keep the ambient temperature of the from going over 50°C/122°F. This prevents the temperature of the GT display unit from rising.
- Locations where condensation may form because of sudden fluctuations in temperature.
- Locations where flammable or corrosive gases are present.
- Locations where there are high concentrations of dust or iron filings.
- Locations where substances such as organic solvents (thinner, benzene, etc.) or strong alkali substances (ammonia, caustic soda, etc.) might adhere to the product.
- Locations where the product is subject to extreme vibration and/or impact.
- Avoid installing the product near high-voltage lines, high-voltage devices, power lines, power devices, amateur radio sets and other transmitters, and devices that generate strong current surges.
- Avoid locations where the display unit is subject to direct sunlight.

Safety Precautions

- The switch functions of the programmable display unit should not be used to design systems which may pose a threat to human life or which may cause severe injury or damage. Designs should include safety mechanisms for use in the event that switch functions do not function correctly.

Power Supply Wiring

- For the power supply, use twisted wire (strand wire).
- There is sufficient noise resistance to offset power line noise, but we recommend reducing noise by measures such as installing an insulated transformer.
- Separate wiring systems should be used for the power supply unit and the operating unit.

Static Electricity/Noise

- Keep the GT01 main unit, PLC connecting cable, and other wiring as far away as possible from machines which are likely to produce noise (welding equipment, power lines, inverters, motors, etc.).
- For use in environments where the frequent occurrence of static electricity, radiation, or induced noise can be expected, the use of shielded cable on all wiring and grounding of shield (1-point ground) is recommended. When wiring the equipment, shielded wires should be electrically insulated to signal lines and signal grounds.
- If excessive static electricity is applied to the panel surface, the LCD display unit may be damaged.

Other Precautions

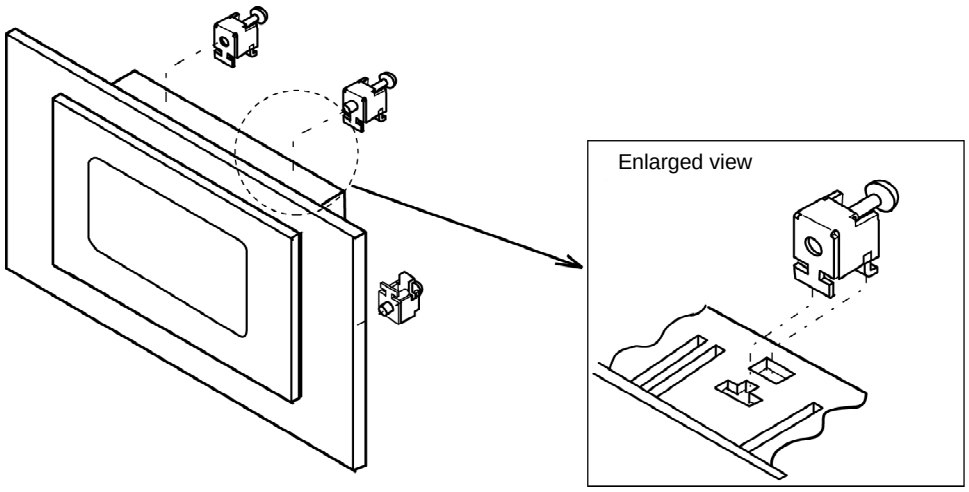
- Do not leave the GT connected to the TOOL port of the FP Programmer II.
- Always operate the touch panel with your fingers. Excessive load (about 98 N/cm^2) or impact (operating with tools, etc.) will cause damage. Touch panel operation must be within the standard operating power range. Uniform pressure should be used to avoid abnormal wear of electrodes which may disable operation. Operate the unit only by touch.
- Never dismantle, re-assemble, or alter the unit. Performance cannot be warranted if this precaution is disregarded.

2.1.2 GT01 Installation Method

Secure the GT01 to the installation panel using the four fittings and four screws provided with the unit.

(1) Place the GT01 main unit in the installation panel.

(2) Insert the fittings into the grooves provided in the GT01 main unit, and tighten the screws to secure the GT01 main unit to the installation panel.



◆ **CAUTION**

- **Screw tightening torque**
  The screw tightening torque should be 0.1 N m to 0.25 N m.
- **Applicable panel thickness**
  A panel with a thickness of 1.0 mm to 5.0 mm should be used.
- **Clearance when the GT01 is installed**
  When installing the GT01, if other parts are being installed to the panel or cables are being wired to it, we recommend providing a clearance of 30 mm to 50 mm/1.18 inch to 1.97 inch around the GT01. This prevents cables from being damaged, and facilitates the installation work. Also, make sure that the slits in the main unit are never obstructed.

2.2 Wiring the Power Supply

2.2.1 Wiring the Power Supply

The power supply should be wired by securely connecting the terminal on the rear of the main unit to the terminal.

Use twisted wiring for the power supply

In order to minimize influence from noise, the wiring for the power supply should be twisted.

Insulate the power supply inside a protective circuit

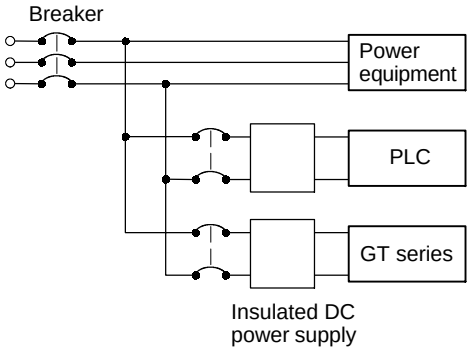
- In order to protect the unit against abnormal voltage from the power supply line, the power supply should be an insulated type, and should be enclosed within a protective circuit.
- A non-insulated regulator is used with the GT series.
- If a power supply device without an internal protective circuit is being used, power should always be supplied to the GT series through a fuse or a similar protective device.

Keep the power supply voltage within the operating voltage range

Operating voltage range	4.5 to 5.5V DC

Keep the power supply wiring separate

- Wiring to the GT series, PLC, and other power equipment should have separate wiring systems.

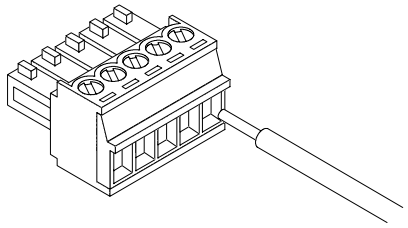


2.3 Wiring the COM. Port

2.3.1 Wiring the COM. Port

Accessory communication connector/applicable wiring

The communication connector used for the COM. port (provided as an accessory with the main unit) has a screw-tightening type of terminal base. The wiring shown below should be used.



Applicable wiring (twisted wiring)

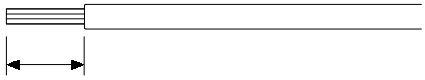
Size	Conductor Cross-Section Surface Area
AGW#28 to 16	0.08 mm^2 to 1.25 mm^2

Use a special tool to tighten the terminal base of the communication connector

Using a screwdriver made by Matsushita Electric Works Co., Ltd. (Product number AFP0806). The tightening torque should be 0.22 N·m to 0.25 N·m or less.

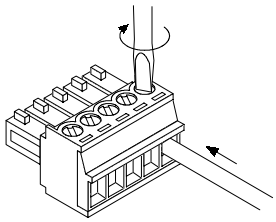
2.3.2 Wiring Method

(1) Remove the sheath from the wire.



7 mm/0.28 inch

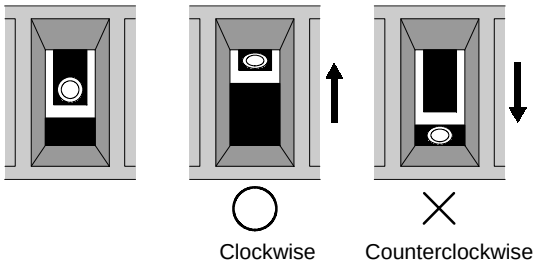
(2) Insert the wire all the way into the terminal base, and tighten the screw in the clockwise direction to secure it.



2.3.3 Precautions Concerning Wiring

The following precautions should be observed, to avoid broken or disconnected wires.

- When removing the sheath, be careful not to scratch the core wire.
- Wire the terminal without twisting the core wire.
- The core wire should be connected without soldering it. Vibration can sometimes cause soldered connections to break loose.
- After connecting the wiring, avoid subjecting the cable to stress.
- Because of the construction of the terminal, tightening the wire in the counterclockwise direction will cause a faulty connection. If this happens, disconnect the wire, check the terminal hole, and connect the wire again.



◆ REFERENCE

For information on connecting the COM. port of the GT series with various PLC units, please see Chapter 4, “Connecting and Communicating with the PLC”, on page 27.

Chapter 3

Setup

3.1 Setup Procedure for the GT01

3.1.1 Setup Procedure

The GT01 should be set up using the procedure outlined below.

(1) Setting the “Configuration File” with GTWIN

The GT01 has an internal file called the “Configuration file”, which is used to determine various operating environment parameters. When the GT01 is shipped from the factory, the settings listed below are set for the parameters in the configuration settings file. If changes are made to these settings, they are made from GTWIN screen creation tool. If the GT01 is being used without changing the factory settings, the following setup procedure is not necessary.

Contents of configuration settings for GT01 when shipped from the factory

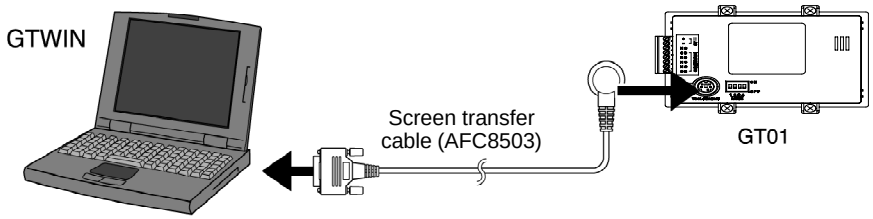
Classification	Item	Setting contents
Basic Setup	Area for basic communication with PLC	Mode : GT01 mode Word area: DT0 to DT2 Bit area : WR0 to WR2
Communication parameter settings	COM. port	Communication speed: 19200 bits/s, data length: 8 bits, stop bit: 1 bit, parity: odd <Communication error temporary processing> Retries: 3, error code displayed (not held)
	TOOL port	Communication speed: 19200 bits/s, data length: 8 bits, stop bit: 1 bit, parity: odd <Through function local setting> None
Auto paging	Automatic paging	No
Startup screen settings	Startup screen	No. 00
	Rise delay time	0 seconds
Other settings	Backlight control	Not turned off automatically
	Touch operation sounds	Valid

Always confirm “Basic communication area to PLC” under “Basic Setup”

This is an internal device area that comes already provided in the GT01 for the purpose of communicating with a PLC. If the factory settings are to be changed, the setup procedure must be carried out. For detailed information, please see page 24.

(2) Connect the GT01 and the personal computer.

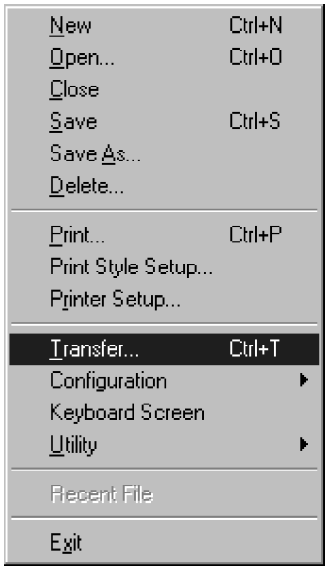
After the settings have been entered with GTWIN, connect the computer and the GT01, using the screen transfer cable.



(3) Transfer the GT01 Configuration file from GTWIN.

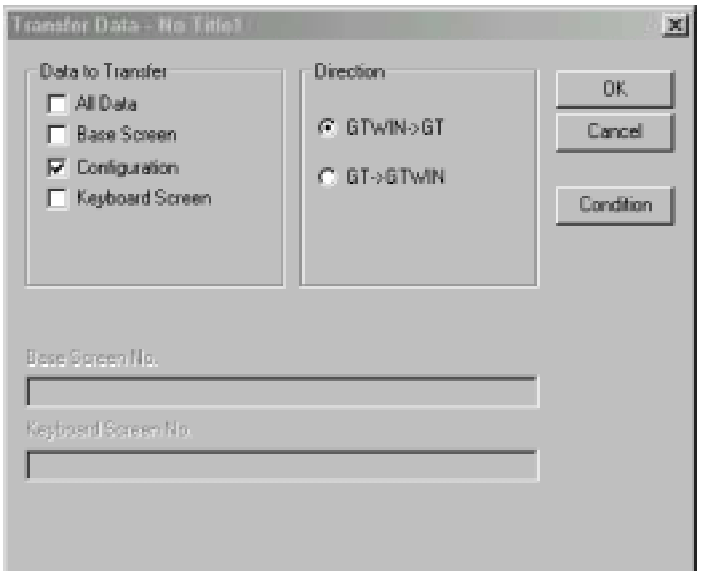
After connections have been completed, use the following procedure to transfer the GT01 Configuration file from GTWIN.

Boot GTWIN, and select “Transfer” on the “File” menu.

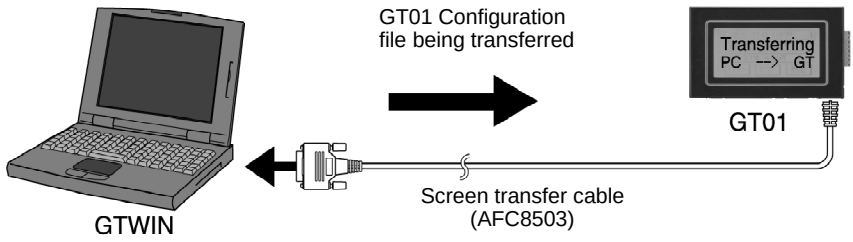


When the transfer function is selected, a dialog box for file transfer is displayed. At this point, specify the type of data to be transferred, and the direction of transfer.

Transfer data: “GT01 Configuration”
Transfer direction: “GTWIN → GT main unit”
Enter the above conditions and click on the “OK” button. The system files are transferred to the GT01.



When the menu operation as shown at the left page is carried out, the configuration file is sent to the GT01. During the transfer, a screen like that shown below is displayed.



(4) Setup is completed.

If the transfer has been completed without any problems, the setup is completed.

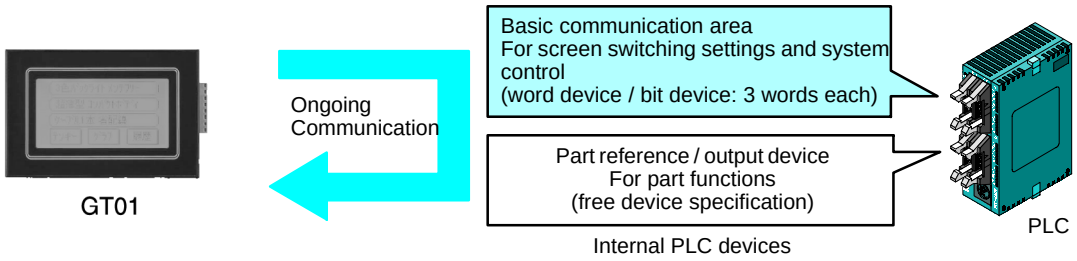
◆ CAUTION

Backup of the GT01 Configuration file
The GT01 Configuration file is stored in the user memory (F-ROM) of the GT01. This file is deleted if the memory is initialized using the command on the system menu of the GT01 main unit (see page 56), and will have to be transferred again.

3.2 Setting the Basic Communication Area Between the GT01 and PLC

3.2.1 What is the Basic Communication Area?

Communication between the GT01 and PLC is carried out as shown below.

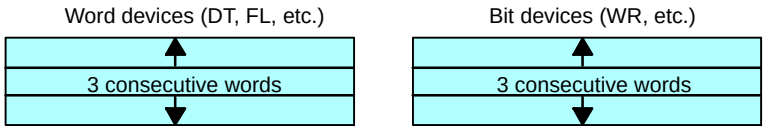


As shown in the illustration, communication is carried out on an ongoing basis between the GT01 and internal devices in the PLC. Internal PLC devices are divided into the following two devices:

Basic communication area

This area is for system control, such as screen switching settings. PLC devices belong to this area on a fixed basis, and communication is constantly being carried out.

Breakdown of the basic communication area



- Word devices - - - For reading devices handled in word units (3 consecutive words)
- Bit devices - - - For reading devices handled in bit units (3 consecutive words)

References and output devices for parts

These are devices that are used in parts functions, and can be freely specified by the user. Communication is carried out on an ongoing basis only for those that are currently displayed on the screen and pertain to devices currently in use.

With the GT01, before GTWIN screen creation tool is used to specify the devices for parts functions, the “basic communication area” must be determined.

DT0 to DT2 and WR0 to WR2 are set as the default values for the basic communication area, but the initial address can be changed using the following procedure.

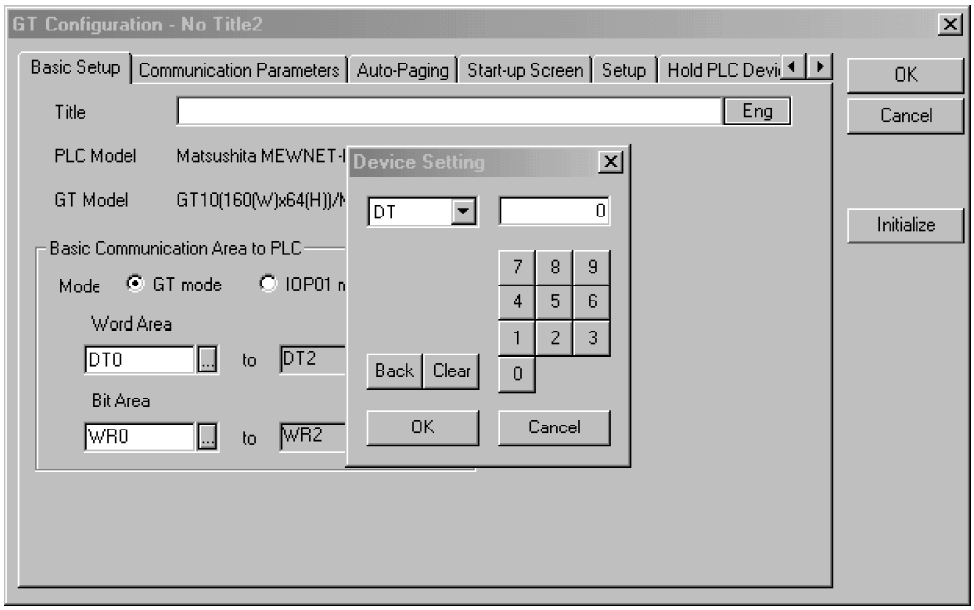
◆ **CAUTION**

The basic communication area should be used in the PLC ladder program to control the GT main unit.

Settings in GTWIN

Select “Configuration” under “File” on the menu bar, and then select the sub-menu called “GTWIN Configuration”. This displays the dialog box for the GT01 Basic Setup, as shown below.
Clicking on the [...] button in “Basic Communication Area to PLC” displays the device settings dialog box shown below, where the initial addresses for the word area and bit area can be changed.

GT01 Configuration Basic Setup dialog box



◆ **Explanation of this function**

Key operation in the Device Settings dialog box
Click on the [▼] button to display a pull-down menu, and then select the device for which settings are to be entered. Use the ten-keys to enter the address.
The [Back] button acts as a backspace key when entering an address, and the [Clear] button functions as a Clear key.

3.2.2 GT01 Basic Communication Area Map

In order for communication to be carried out between the GT01 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT main unit through the PLC ladder program actually being run.
The starting address “N” of the field shown below is specified in the GT01 configuration settings of GTWIN screen creation tool, and is then sent to the GT main unit.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen no. specified by PLC (area read by GT01 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT01 to PLC)															

Explanation of system area

Screen no. specified by PLC - - - The screen number displayed on the GT01 is specified from the PLC in hexadecimal format.

No. of currently displayed screen - - - The number of the screen currently displayed on the GT01 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced-display flag	Backlight Valid flag	Backlight Flashing	Backlight Color											
N+1	Usage prohibited															
N+2																Data Input In Progress flag

Explanation of system areas

BZ - - - This turns on the buzzer.

Forced-Display flag - - - At the rise when the bit is turned on, the screen specified by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag - - - When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing - - - 0: Lighted (normal), 1: Flashing

Backlight Color - - - 00: Off, 01: Green, 10: Red, 11: Orange

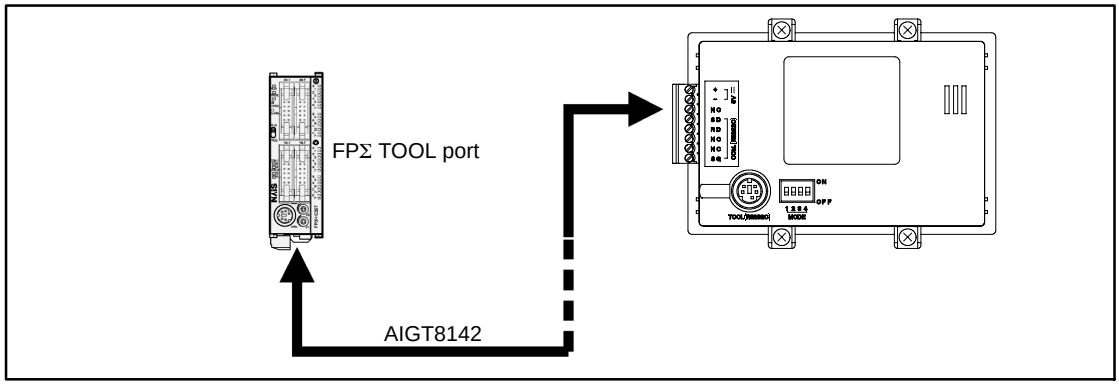
Data Input In Progress flag - - - This is 1 while data is being input, and 0 when data input has been completed.

Chapter 4

Connecting and Communicating with the PLC

4.1 Connecting the FPΣ

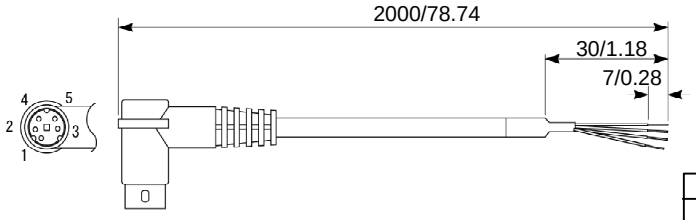
4.1.1 Connecting to the TOOL Port



FPΣ communication format settings

System register no.	Item	Value Set
410	TOOL Port Unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	Line return code	CR (Fixed)
	Start code	no STX (Fixed)
415	COM. Port 1 Communication speed setting	19200 bits/s

PLC communication cable: Mini-DIN 5-pin loose-wire cable (AIGT8142)



Mini-DIN plug side signals

Pin no.	Abbreviation	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	- -	- -
5	+5V	White

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m/6.56 ft	AIGT8142

Connecting to the FPΣ TOOL port

PLC side

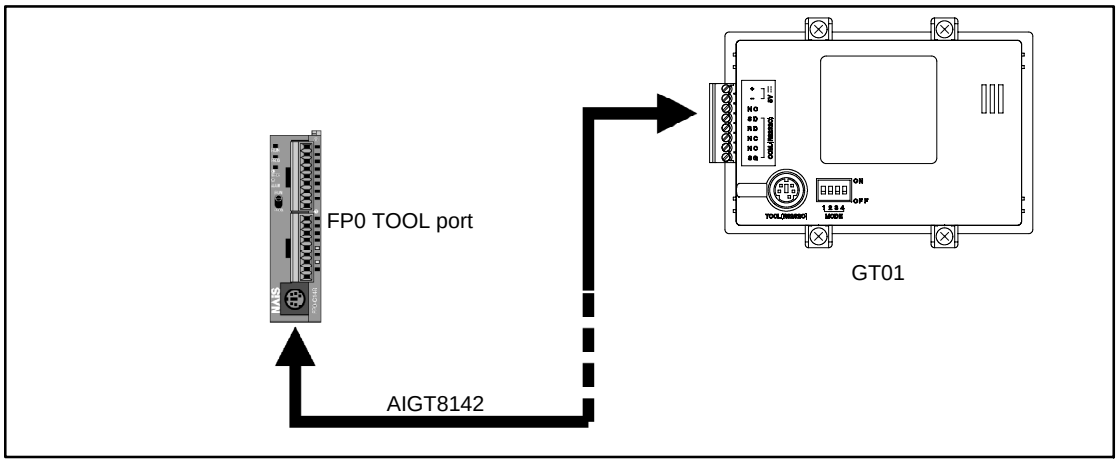
Pin no.	Abbreviation
1	SG
2	SD
3	RD
4	- -
5	+5V

GT main unit side

Pin no.	Abbreviation
1	+
2	-
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

4.2 Connecting the FP0

4.2.1 Connecting to the TOOL Port

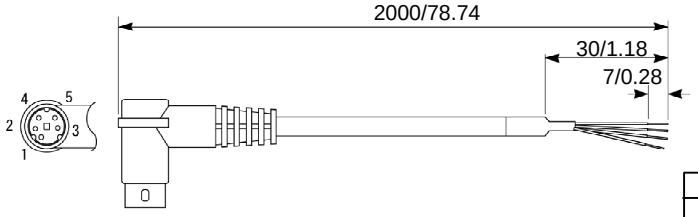


FP0 communication format settings

System register no.	Item	Value Set	System register value
410	Unit number	1	K1
411	Data length	8 bits	H0
	Modem connection	No connection	
414	Baud rate setting	19200 bits/s	H010X X is 0 to 6

←To set 19200 bits/s for both the COM. port and the TOOL port, “H0100” should be set.

PLC communication cable: Mini-DIN 5-pin loose-wire cable (AIGT8142)

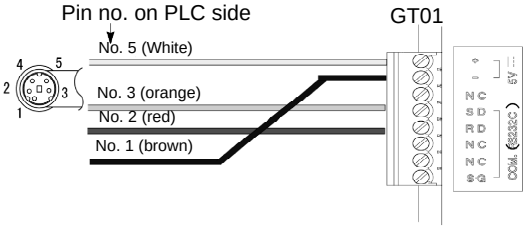


Mini-DIN plug side signals

Pin no.	Abbreviation	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	- -	- -
5	+5V	White

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m/6.56 ft	AIGT8142

Connecting to the FP0 TOOL port



PLC side

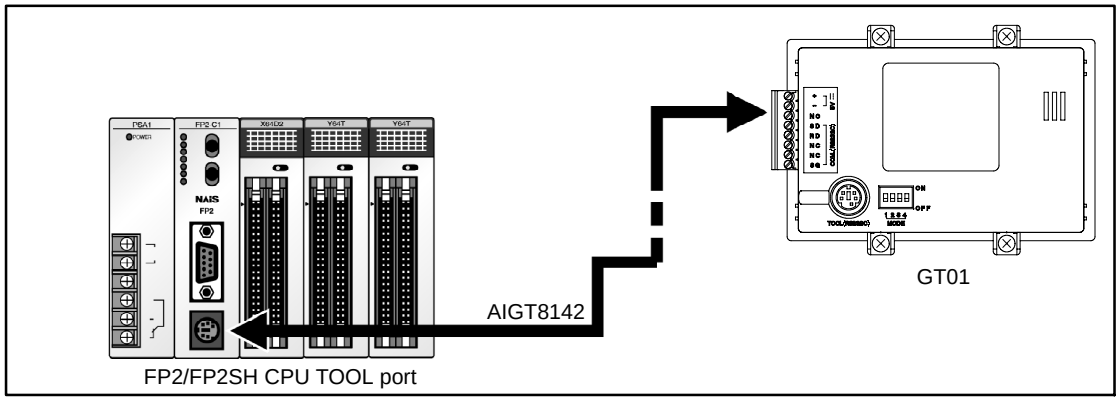
Pin no.	Abbreviation
1	SG
2	SD
3	RD
4	- -
5	+5V

GT main unit side

Pin no.	Abbreviation
1	+
2	-
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

4.3 Connecting the FP2/FP2SH

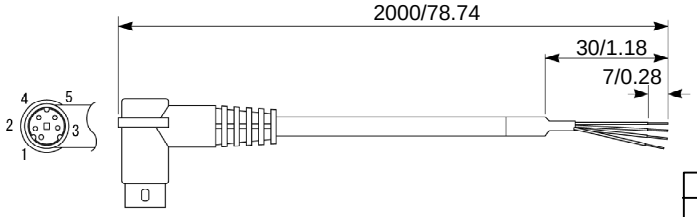
4.3.1 Connecting to the TOOL Port



FP2/FP2SH communication format settings

System register no.	Item	Value Set
410	Unit number	1
411	Data length	8 bits
	Modem connection	No connection
414	Baud rate setting	19200 bits/s

PLC communication cable: Mini-DIN 5-pin loose-wire cable (AIGT8142)



Mini-DIN plug side signals

Pin no.	Abbreviation	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	- -	- -
5	+5V	White

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m/6.56 ft	AIGT8142

Connecting to the FP2/FP2SH TOOL port

PLC side

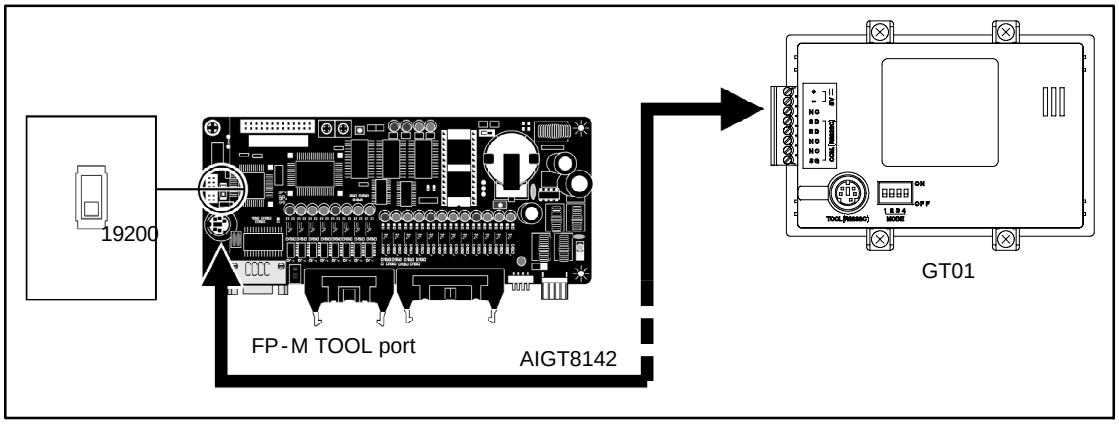
Pin no.	Abbreviation
1	SG
2	SD
3	RD
4	- -
5	+5V

GT main unit side

Pin no.	Abbreviation
1	+
2	-
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

4.4 Connecting the FP-M

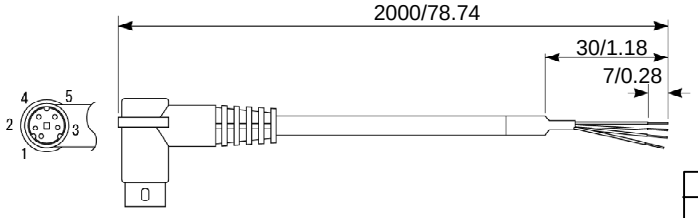
4.4.1 Connecting to the TOOL Port



FP-M communication format settings

System register no.	Item	Value Set	System register value
410	Unit number	1	K1
411	Data length	8 bits	H0
	Modem connection	No connection	

PLC communication cable: Mini-DIN 5-pin loose-wire cable (AIGT8142)



Mini-DIN plug side signals

Pin no.	Abbreviation	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	- -	- -
5	+5V	White

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m/6.56 ft	AIGT8142

Connecting to the FP-M TOOL port

PLC side

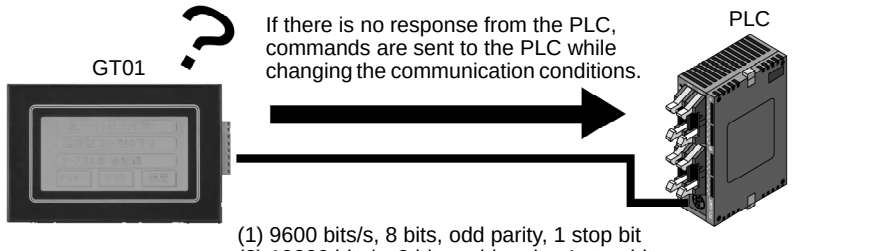
Pin no.	Abbreviation
1	SG
2	SD
3	RD
4	- -
5	+5V

GT main unit side

Pin no.	Abbreviation
1	+
2	-
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

4.5 Automatic Communication Settings Function

After turning on the power supply, if there is no response from the PLC connected to the GT01, the GT01 switches to the automatic setting mode for the communication conditions. In the automatic setting mode, commands are sent to the PLC while changing the communication conditions in the sequence shown below.



(1) 9600 bits/s, 8 bits, odd parity, 1 stop bit
(2) 19200 bits/s, 8 bits, odd parity, 1 stop bit
(3) 115200 bits/s, 8 bits, odd parity, 1 stop bit
(4) Communication conditions set in GTWIN Configuration Settings

The GT01, in automatic setting mode, continues to repeat steps (1) to (4) until there is a response from the PLC. While it is repeating these steps, it is in the “Standby” mode under “GT01 Configuration” a “Communication Parameters” a “Handle Communication Error” on GTWIN. For information on how settings are entered, please refer to page 43.

◆ Explanation of this function

- **Conditions when the automatic settings mode is in effect**
  If communication is attempted the specified number of times and there is no response from the PLC, the GT01 goes into the automatic settings mode. The number of attempts is specified using the “No. of Retries” parameter under “GT01 Configuration” → “Communication Parameters” → “Handle Communication Error” on GTWIN. For information on how settings are entered, please refer to page 43.
- **Automatically set communication conditions**
  In the automatic settings mode, if there is a response from the PLC, subsequent communication is carried out under conditions matching the response. The main unit configuration settings are not updated, however, even if the communication parameters are different from those of the main unit configuration settings.

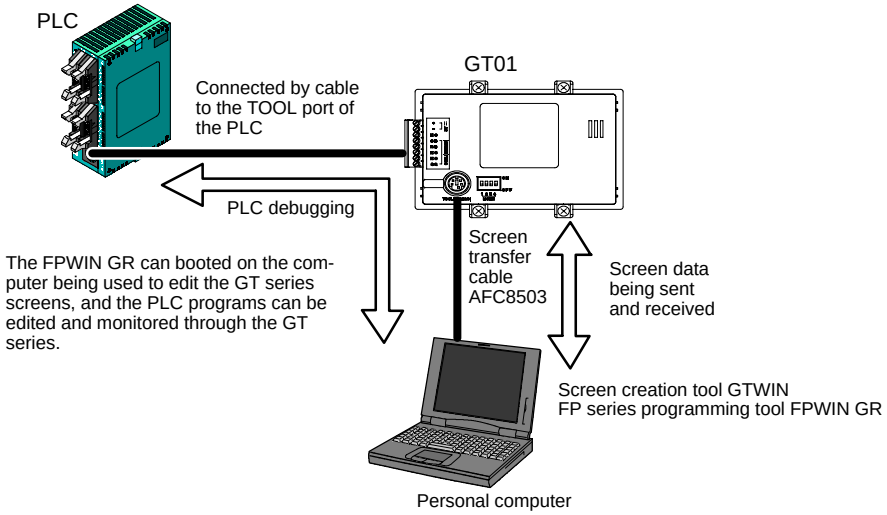
◆ CAUTION

- **An error response from the PLC is taken as a response, and the GT01 does not go into the automatic settings mode.**
- **If the unit is connected to the COM port of the FP0/FP1/FP2/FP2SH/FP-M, communication between the FP device and the PLC will not be possible if the target usage of the RS232C port has been set to “Computer Link”. Always set the setting on the PLC side to match “Computer Link”. For detailed information, please refer to Chapter 4, “Connecting and Communicating with the PLC”, on page 27.**

4.6 Through Function

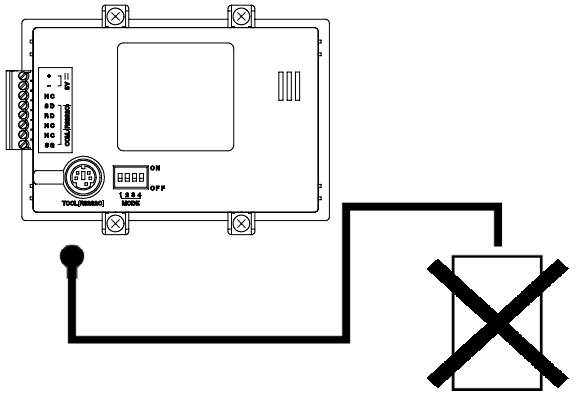
With the GT series, communication can be set to take place automatically between the COM. and TOOL ports in a “through function”. When the FP series tool software installed in the computer connected to the GT series as shown below is booted, PLC programs can be edited through the GT series.

The through function does not require any special settings, and is always in the standby mode.


PLC
GT01
Connected by cable to the TOOL port of the PLC
PLC debugging
The FPWIN GR can booted on the computer being used to edit the GT series screens, and the PLC programs can be edited and monitored through the GT series.
Screen transfer cable AFC8503
Screen data being sent and received
Screen creation tool GTWIN
FP series programming tool FPWIN GR
Personal computer

◆ CAUTION

- **Precautions when using the through function**
  The system should be set up so that the interval for communication retries in the FP series software (FPWIN GR or NPST-GR) (A) is larger than that of the GT01 COM. port (B), meaning (A) > (B). If the system is set up so that A = B or A < B, the through function will not work properly.
- **Restrictions on COM. port connections**
  When connecting the GT01 to the COM port of a PLC, a separate external DC 5 V power supply must be provided. Be sure to remember this.
- **An FP Programmer II cannot be connected to the tool port.**



FP Programmer II

Chapter 5

GT01 Configuration Settings

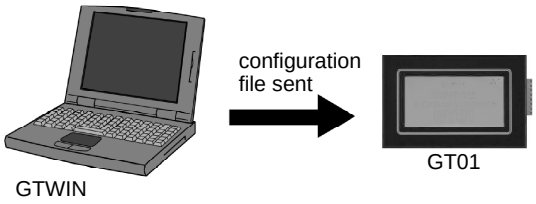
5.1 GT01 Configuration Settings

Before using the GT01 for the first time, it must be set up by entering the GT01 configuration settings indicated below. Always check and enter the settings under “Basic communication area to PLC”. For instructions on setting up the GT01, see page 24.

5.1.1 Two Types of GT01 Configuration Settings

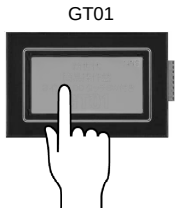
1. Entering configuration settings from GTWIN screen creation tool .. page 40

With this method, GT01 configuration settings are entered from GTWIN screen creation tool, and the GT01 configuration file is sent to the GT01. Most items can be set using this method.



2. Entering configuration settings from the GT01 main unit ..... page 52

Some of the settings, such as the communication parameters, the internal clock, and adjustments of the liquid crystal display contrast, can be set using the system menu of the GT01. Settings are entered using the touch switches on the front of the panel.



◆ Explanation of this function

Items in the GT01 Configuration Settings

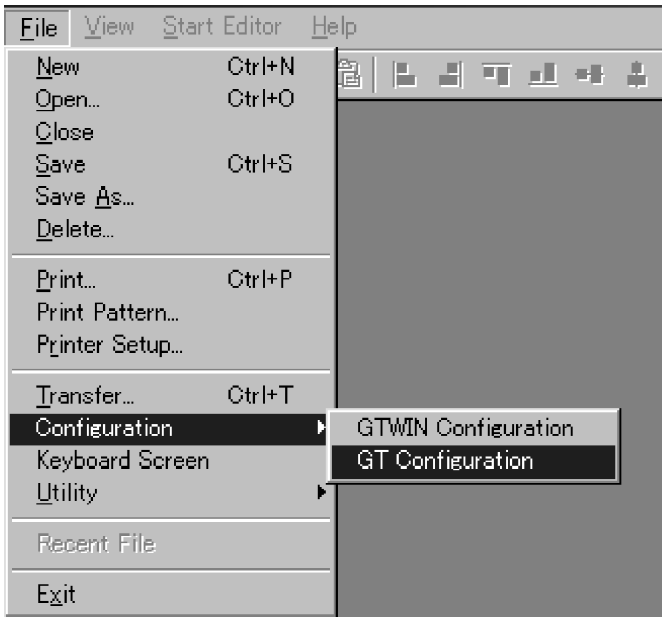
Items that can be set from GTWIN	Items that can be set either way	Items that can be set from the GT01 system menu
Title setting	Communication parameters	LCD contrast setting
Type of PLC connected		Communication parameters
Basic communication area to PLC		Memory initialization
Communication parameters		Self-diagnosis
Auto-paging screen settings		
Startup screen (default screen) settings		
Reference destination setting for clock		
Backlight control		
Touch sounds		

5.2 Entering Configuration Settings from GTWIN Screen Creation Tool

This section describes how configuration settings for the GT01 are entered from GTWIN screen creation tool.

5.2.1 Opening the GT Configuration Settings

The GT configuration settings are set by selecting [Configuration] on the menu displayed by clicking with the mouse on [File] or pressing the Alt + F keys. Then select the “GT Configuration” sub-menu under [Configuration].



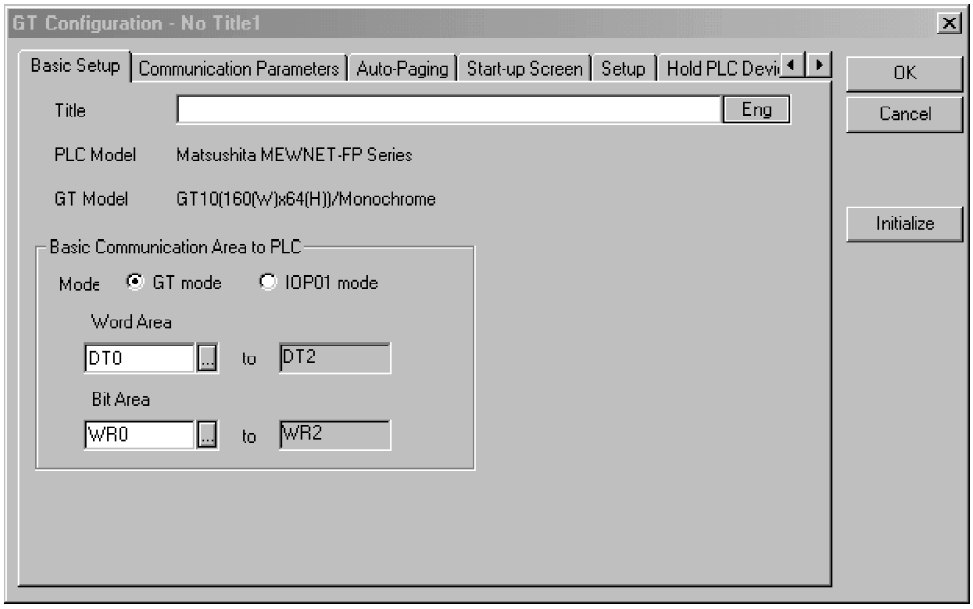
Configuration Settings

GTWIN Configuration - - - These are operating environment settings for GTWIN.
GT Configuration - - - These are configuration settings for the GT01. The file is sent from GTWIN to the GT01 after the settings have been entered.

5.2.2 GT Configuration Settings: “Basic Setup”

Selecting [Configuration] on the [File] menu of GTWIN and then the sub-menu [GT Configuration] displays the “Basic Setup” screen shown below.
This is used to specify the basic communication area used for communication between the GT01 and PLC, and the environment required for GT01 operation.

“Basic Setup” screen



Title - - - The title of the configuration settings file is entered here. Titles are convenient if each GT01 has its own configuration settings.

PLC Model - - - The model of PLC specified when GTWIN is booted is displayed here.

GT Model - - - The model of GT specified when GTWIN is booted is displayed here.

Basic communication area to PLC

This is used to specify the mode in which communication takes place between the GT01 and PLC, and the internal PLC device used for basic communication.

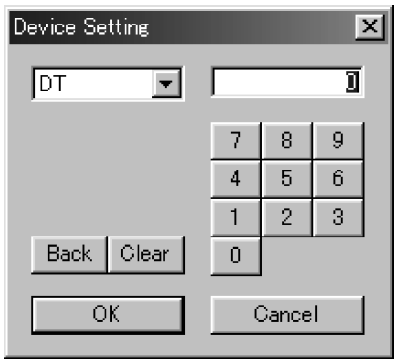
Device used

This specifies the internal PLC device used for basic communication between the GT01 and PLC.

- Word area - - - This specifies the type of device that reads and writes screen numbers and other information in word units, and the initial address.
- Bit area - - - This specifies the type of device that reads and writes backlight control and other bit information, and the initial address.

The type of device and addresses can be set by clicking on the [...] buttons for the various items.

Device settings dialog box



Clicking on the [▼] button displays a pull-down menu. Select the device for which settings are to be entered, and use the ten-keys to enter addresses.

The [Back] button functions as a backspace key when entering addresses.

The [Clear] button acts as a Clear key.

◆ **REFERENCE**

For detailed information on the basic communication area map, see “GT01 Basic Communication Area Map” on page 26.

◆ **Explanation of this function**

Standard settings

Clicking on the [Standard] button in the “GT Configuration” dialog box displays the following message. Clicking on [OK] sets the default values (the configuration settings entered when the unit is shipped) for all of the settings.

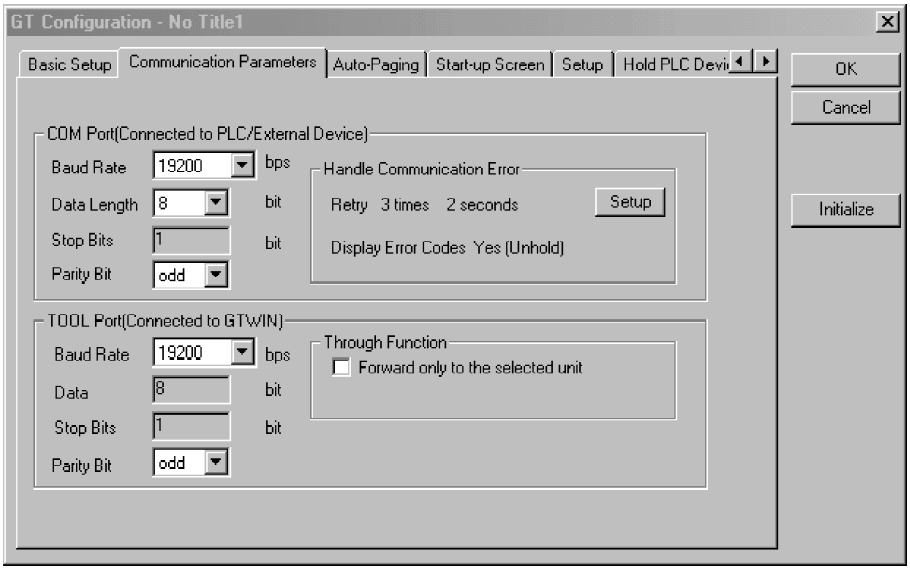
For information on the contents of configuration settings entered when the unit is shipped, see “Contents of configuration settings for GT01 when shipped from the factory” on page 21.

5.2.3 GT Configuration Settings: “Communication Parameters”

Clicking on the “Communication Parameters” tab in the “GT Configuration” dialog box displays the following screen.

This is where communication parameters for the PLC and personal computer (GTWIN) connected to the GT01 are set.

“Communication Parameters” screen



COM. port (Connected to PLC/External Device)

This is used to specify the communication speed and transmission format when the GT01 is connected to an external device (PLC).

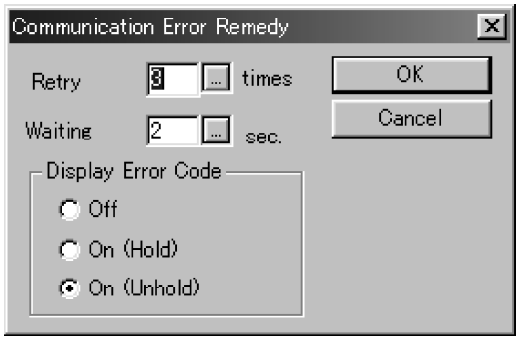
Clicking on the button displays a pull-down menu from which the value to be set can be selected.

- Baud Rate - - - Select 9600, 19200, 38400, 57600, 76,800 or 115200 bits/s.
- Data Length - - - Select either “7 bits” or “8 bits”.
- Stop Bits - - - This is fixed at “1 bit”.
- Parity Bit - - - Select “None”, “Odd”, or “Even”.

Handle Communication Error

Clicking on the Setup button displays the “Communication Error Remedy” dialog box. This is used to specify the processing to be used if a communication error occurs.

“Communication Error Remedy” dialog box



For “Retry” and “Waiting”, click the ... button and specify the values in the “Value Set” dialog box that is displayed.
For “Display Error Code”, select “Off”, “On (Hold)”, or “On (Unhold)” by clicking the radio button of the desired value to turn it on.

Retry - - - This specifies the number of retries if a communication error occurs. The setting range is from 0 to 255 times.

Waiting - - - This specifies the interval between retries if a communication error occurs. The setting range is from 0 to 255 seconds.

“Display Error Code”

This switches the setting for the error code display used if a communication error occurs.

Off - - - No error code is displayed if a communication error occurs.

On (Hold) - - - An error code is displayed at the upper right of the screen if a communication error occurs, and continues to be displayed until the power supply is turned off.

On (Unhold) - - - An error code is displayed at the upper right of the screen if a communication error occurs, and is cleared when the cause of the error is eliminated.

For contents of error codes, please see “Error Codes and How to Handle Them” on page 78.

TOOL Port (for GTWIN connection)

This is used to specify the communication speed and transmission format when the GT01 is connected to a personal computer (GTWIN).

Clicking on the button displays a pull-down menu from which the value to be set can be selected.

- Baud Rate - - - Select 9600, 19200 or 115200 bits/s.
- Data Length - - - This is fixed at “8 bits”.
- Stop Bits - - - This is fixed at “1 bit”.
- Parity Bit - - - Select “None”, “Odd”, or “Even”.

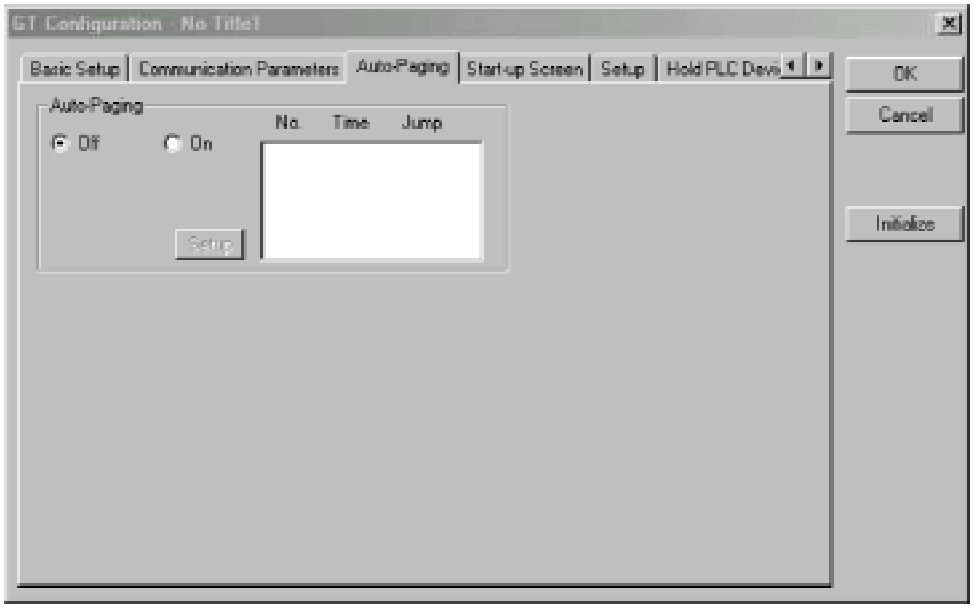
Through function

If the “Forward only to the selected unit” check box is turned on, communication can be carried out via the through function only with unit numbers for a PLC received from a higher-order personal computer or higher-order PLC.

5.2.4 GT Configuration Settings: “Auto-Paging”

Clicking on “Auto-Paging” in the “GT Configuration” dialog box displays the screen shown below. Here, settings can be entered for a functions that automatically switches the screens displayed on the GT01.

“Auto-Paging” screen



Auto-paging

This is used to specify the “Auto-paging function”, which automatically switches the specified screen when a given period of time has elapsed.

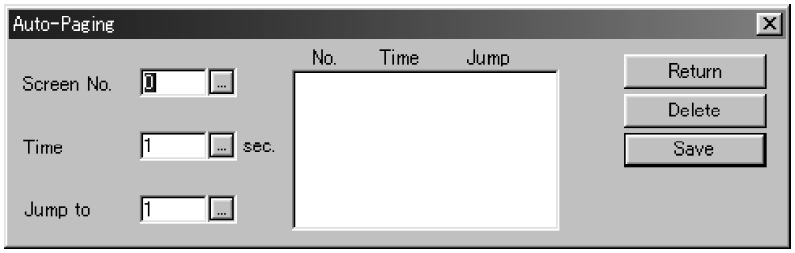
Off - - - The screen is not switched automatically.

On - - - The screen is switched automatically, in conformance with the specified contents.

Auto-paging settings

If “On” is selected for auto-paging, and the [Setup] button is clicked, a dialog box containing the following auto-paging settings is displayed.

Clicking on the [...] button for “Screen No.”, “Time”, or “Jump to” displays a “Value Set” dialog box. Set the value and click the [Save] button to save values one at a time.



Screen No. - - - This specifies the screen targeted for auto-paging.

Time - - - This specifies the time for which the screen specified above is displayed. The setting range is from 1 to 255 seconds.

Jump to - - - This specifies the number of the next screen to be displayed.

[Return] - - - This completes the auto-paging settings and returns to the “Auto-Paging” dialog box.

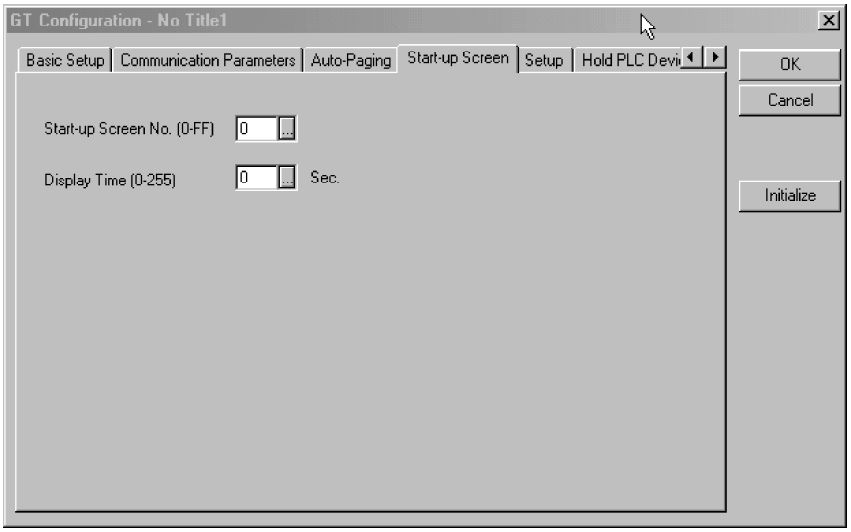
[Delete] - - - This deletes screens registered for auto-paging.

[Save] - - - This saves the settings for the screen number, time, and jump destination as auto-paging settings.

5.2.5 GT Configuration Settings: “Startup Screen Settings”

Clicking on “Start-up Screen” in the “GT Configuration” dialog box displays the screen shown below. Here, the screen displayed when the GT01 is booted can be specified.

“Start-up Screen” screen



This is used to specify the screen that will be displayed when the GT01 is booted, as well as the time it will be displayed. Clicking on the [...] button for each of the items displays a “Value Set” dialog box where the values can be specified.

Start-up Screen No. - - - This specifies the number of the screen that will be displayed when the GT01 is booted. Clicking on the [...] button displays a “Value Set” dialog box where the value for the start-up screen number can be specified.

Display Time - - - This specifies the time for which the startup screen specified above will be displayed. The value can be set to any number between 0 and 255 seconds. Clicking on the [...] button displays a “Value Set” dialog box where the start-up delay time can be specified.

◆ Key points

- **When the above settings are entered, the screen specified with the “Startup Screen No.” parameter is displayed for the amount of time specified with the “Display Time” parameter.**
- **When the amount of time specified with the “Display Time” parameter elapses, the screen corresponding to the number stored in the initial address of the word device under “Basic Communication Area to PLC” in the “Basic Setup” parameters under “GT Configuration” will be displayed.**
- **This function is used when it is necessary to delay the start-up time when the power supply on the PLC side is turned on.**

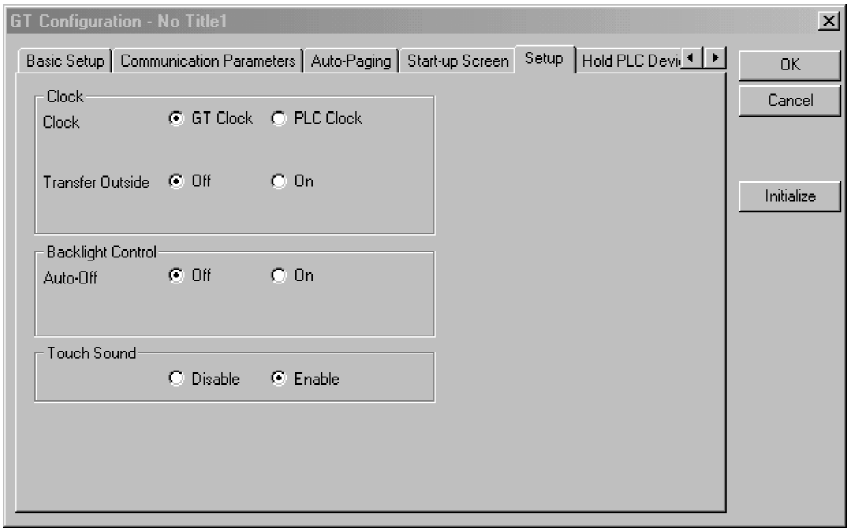
◆ CAUTION

- **Communication between the GT01 and the PLC (external device) cannot be carried out during the time specified by the “Display Time” parameter.**

5.2.6 GT Configuration Settings: “Setup”

Clicking on the “Setup” tab in the “GT Configuration” dialog box displays the screen shown below. Here, clock functions, backlight control, and other parameters can be specified.

“Setup” screen



Clock

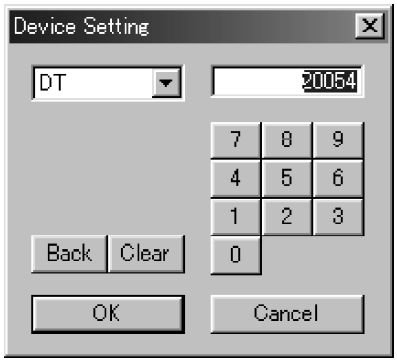
Clock

This is used to specify the reference destination for the clock displayed with the GT01. Select one of the radio buttons.

PLC Clock - - - When the time is displayed, the internal clock in the PLC is used as a reference for the value.

If the “PLC Clock” is referenced for the clock setting, clicking on the [...] button displays a screen where the type of device and the address can be specified.

Device Setting dialog box



Click on the [▼] button to display the pull-down menu, and select the device from that menu. Enter the address using the ten-keys.

The [Back] button functions as a backspace key when entering addresses.

The [Clear] button acts as a Clear key.

Backlight control

Auto-Off

This is used to specify the Auto-Off backlight feature.

Off - - - The Auto-Off backlight feature is not used.

On - - - Auto-Off backlight feature is used. This parameter specifies the period of time that the GT01 is inactive before the backlight goes off automatically.

If “On” is set for the above Auto-Off backlight feature, clicking on the ... button displays a screen where the time until the backlight goes off can be specified. Any time from one minute to 30 minutes can be specified.

◆ **Key points**

If the backlight is turned off automatically using the backlight control function, touching the screen turns it on again. If a touch switch happens to be located at that point on the screen, it will be invalid until the backlight has gone on again.

Touch Sounds

This sets the touch sounds corresponding to GT01 screens as either invalid or valid. Select one of the radio buttons.

Disable - - - Touch sounds are disabled.

Enable - - - Touch sounds are enabled.

5.3 Entering Configuration Settings from the GT01 Main Unit

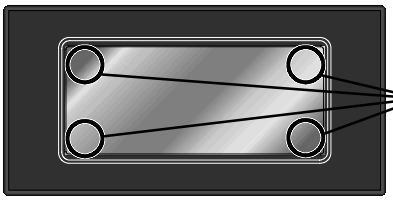
5.3.1 What is the System Menu?

The system menu is a dedicated screen on which configuration settings for the GT01 are entered. Some of the items that can be specified here can also be set using GTWIN screen creation tool and then sent to the GT01, but others, such as the adjustments to the LCD contrast level, can only be set using the system menu. This section explains how configuration settings are entered using the system menu.

5.3.2 Bringing Up the System Menu

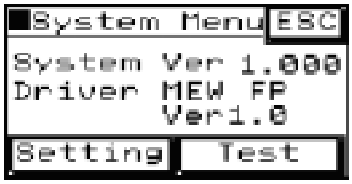
The following procedure is used to bring up the system menu.

(1) Touch the LCD touch panel simultaneously.



1. Press the top left corner (A) for more than one second.
2. Next, immediately press the top right corner (B) and the bottom right corner (C), in that order.

(2) The initial screen of the system menu is displayed.



The initial screen of the system menu is displayed on the GT01. Touching either the [Setting] or [Test] key shifts to the next screen.
Touching the [ESC] key exits the system menu and returns to the normal operating mode.

"System Ver" indicates the ROM version of the GT01 system.

(3) Select the mode.

[Setting]: Setting mode initial screen

This is where configuration settings for the GT01, such as the contrast, clock, COM. port, TOOL port, and memory, are specified.

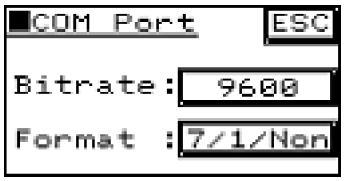
[Test]: Test mode initial screen

This is where GT01 configuration elements such as the touch switches, backlight, clock, buzzer, LCD, contrast, and memory are tested.

5.3.3 Setting Mode: “Communication Parameters” (COM. Port / TOOL Port)

Touching the [Setting] key on the initial screen of the system menu and then touching the [COM. Port] and [TOOL Port] keys on the setting mode menu displays the communication parameters setting screen. Here, parameters controlling communication between the PLC and personal computer (GTWIN) connected to the GT01 are specified.

COM. port communication parameter settings (PLC communication parameter settings)



Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[COM. port]

Bitrate: PLC communication speed

This sets the communication speed, or Baud rate, for communication with an external device (PLC) connected to the GT01.
Each time the [Function] key is pressed, the Baud rate switches in the sequence of 9600, 19200, 38400, 57600, 115200 bits/s. Set the speed to match that of the PLC connected to the GT01.

Format: Transmission format

This sets the communication parameters (data length, stop bits, parity) for the external device (PLC) connected to the GT01.
The items displayed are: Data length / Stop bit / Parity, and each time the [Function] key is pressed, the display switches in the sequence of: [7/1/None], [7/1/Odd], [7/1/Even], [8/1/None], [8/1/Odd], [8/1/Even]. Set the parameters to match those of the PLC connected to the GT01.

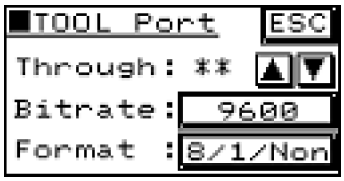
◆ Learning the shortcut keys saves time!

[RETURN]To complete the settings and return to the previous screen, touch the [ESC] key.

◆ Explanation of this function

COM. port communication parameter settings
The default (initial) values for the COM. port communication parameter settings are: 19200 bits/s, 8/1/Odd.

TOOL Port communication parameter settings (GTWIN communication parameter settings)



Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[TOOL Port]

Through function: Through function destination setting

When the through function is being used, this specifies the number of the PLC at the other end of the connection. Normally, when used in a 1 : 1 configuration, this should be set to “00”.

Bitrate: GTWIN communication speed

Each time the [Function] key is touched, the Baud rate switches in the sequence of 9600/19200/115200 bits/s. Set the speed to match that of the personal computer (GTWIN) connected to the GT01.

Format: Transmission format

This sets the communication parameters (data length, stop bits, parity) for the personal computer (GTWIN) connected to the GT01.
The items displayed are: Data length / Stop bit / Parity, and each time the [Function] key is pressed, the display switches in the sequence of: [8/1/None], [8/1/Odd], [8/1/Even].

◆ Learning the shortcut keys saves time!

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

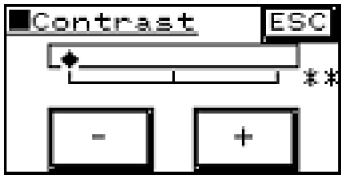
◆ Explanation of this function

TOOL Port communication parameter settings
The default (initial) values for the TOOL Port communication parameter settings are: 19200 bits/s, 8/1/Odd.

5.3.4 Setting Mode: “Liquid Crystal Display Contrast Adjustment” (Contrast)

Touching [Setting] on the initial screen of the system menu and then the [Contrast] key of the setting mode menu displays the contrast adjustment screen. The contrast of the GT01 LCD is adjusted here.

Contrast adjustment screen



Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[Contrast]

◆ **Learning the shortcut keys saves time!**

[ADJUST] Touching the [+] key increases the contrast, and touching the [-] key decreases it.

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

5.3.5 Setting Mode: “Memory Initialization” (Clear Memory)

Touching [Setting] on the initial screen of the system menu and then the [Memory] key of the setting mode menu displays the memory initialization screen. The internal user memory of the GT01 is initialized here.

Memory initialization screen

Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[Memory]

Touching the [SRAM] key deletes clock data and Hold PLC Device data held in the SRAM.

Touching the [FROM] key deletes screen data and main unit configuration settings saved to the main unit user memory (F-ROM).

When either of the above keys is touched, a confirmation message reading CLEAR OK? is displayed. To clear the data, touch the CLEAR OK? key. A buzzer sounds, and the memory is cleared. When the buzzer stops sounding, the memory has been completely cleared.

◆ Learning the shortcut keys saves time!

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

◆ CAUTION

- **[SRAM] initialization deletes the Hold PLC Device data backed up in the SRAM. Please be sure that you want to do this before initializing the SRAM.**
- **[FROM] initialization deletes the base screen data, the main unit configuration setting data (the main unit configuration setting data returns to the default values) and contrast adjustment setting data (the contrast returns to the default value) in the user memory (F-ROM) of the main unit. Before initializing the F-ROM, always save screen data to a floppy disk or another medium with GTWIN.**

5.3.6 Test Mode: “Self-Diagnosis”

Touching the [Test] key on the initial screen of the system menu displays the self-diagnosis screen. This is used to run a hardware check of the memory, buzzers, and other elements of the GT01.

Test mode screen

Procedure for bringing up the screen
[Initial screen]
↓
[Test] key

Touch SW

This runs an operation check of the touch switches.

B. Light

The color of the backlight changes at one-second intervals (in sequence from green a red a green a orange).

Buzzer

This runs an operation check of the buzzer.

LCD

This displays a pattern and runs an operation check of the display.

Contrast

Touch the [+] and [-] keys to check changes in the contrast.

◆ Learning the shortcut keys saves time!

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

◆ Explanation of this function

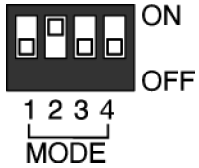
- **Test mode (self-diagnosis) screen**
  On the test mode screen, the item name of the item that was just tested is highlighted.
  (The dots are cleared when the screen is returned to the initial screen of the system menu.)

5.3.7 Inhibiting the System Menu Display

In order to prevent unauthorized persons from being able to change GT01 configuration settings, the GT01 is set up so that DIP switches can be used to make it impossible to display the system menu.

If the second operation mode setting switch is turned on, as shown at the left, access to the system menu is denied.

Operation mode setting switches



Switch no.	Function	OFF	ON
1	Usage inhibited	Should always be in the “OFF” position when unit is used.	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the “OFF” position when unit is used.	
4			

Chapter 6

How the Various Functions Are Used

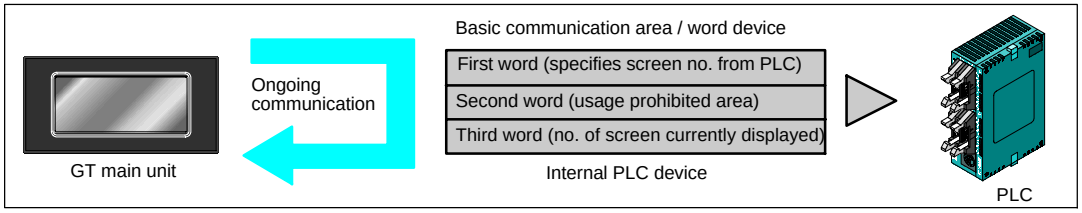
6.1 Switching Screens

There are three ways to switch screens registered in the GT main unit.

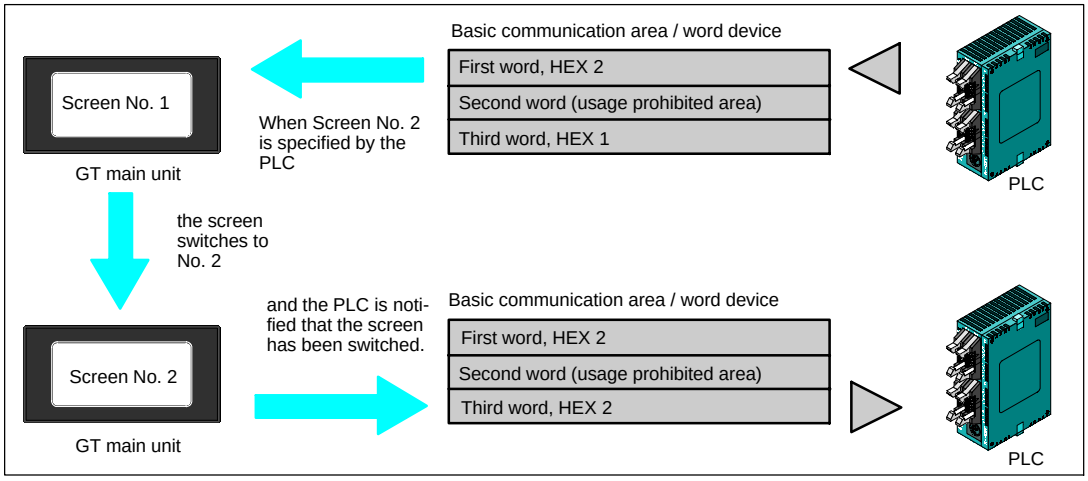
6.1.1 Switching the Screen from the PLC

GT main unit screens can be switched from the PLC ladder program, by writing the number of the screen to be displayed in hexadecimal format to the initial word of the word device in the basic communication area.
At the same time that the screen is switched, the GT main unit writes the number of the screen to which the display was switched in the first to third words of the basic communication area, in hexadecimal format.

How communication is carried out between the GT main unit and PLC (screen switching)

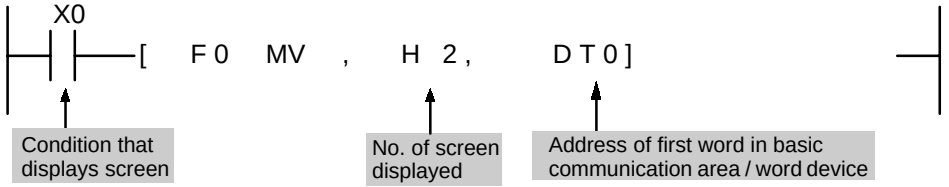

Basic communication area / word device
First word (specifies screen no. from PLC)
Second word (usage prohibited area)
Third word (no. of screen currently displayed)
Ongoing communication
GT main unit
Internal PLC device
PLC

How screens are switched


Basic communication area / word device
First word, HEX 2
Second word (usage prohibited area)
Third word, HEX 1
Screen No. 1
When Screen No. 2 is specified by the PLC
GT main unit
PLC
the screen switches to No. 2
and the PLC is notified that the screen has been switched.
Basic communication area / word device
First word, HEX 2
Second word (usage prohibited area)
Third word, HEX 2
Screen No. 2
GT main unit
PLC

Example of ladder program

Basic screen display program


X0
[F0 MV , H 2, DT0]
Condition that displays screen
No. of screen displayed
Address of first word in basic communication area / word device

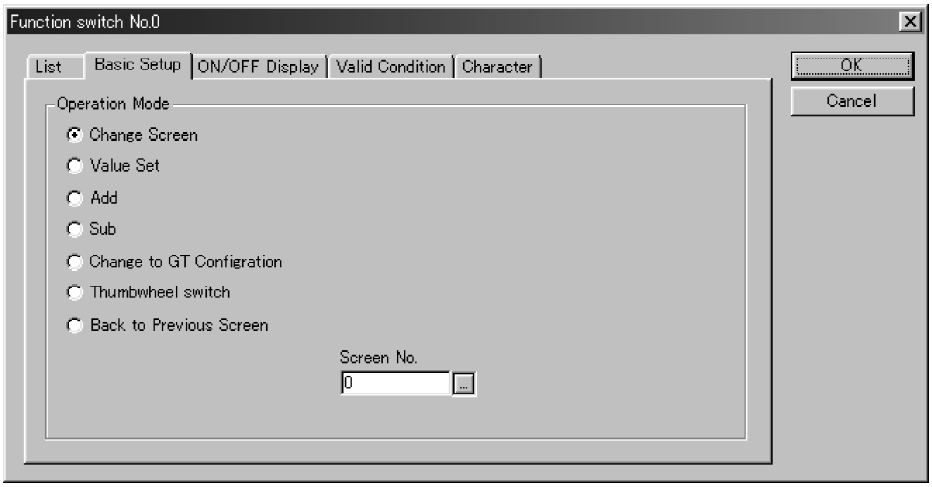
When the screen is switched as a means of triggering switch output from the display unit, the destination for the switch output should be specified in the condition that displays the screen, indicated in the sample program above.

6.1.2 Switching the Screen with the GT Main Unit

Using the function switch unit

GTWIN has “function switching parts” (FSW0, FSW1, FSW2) in the parts library that can be used to switch screens on the GT main unit. These parts should be arranged on the base screen and assigned the attributes indicated below.

Function switching parts: Attribute editing dialog box



Double-clicking on the parts arranged on the base screen, or selecting a switch part, and clicking on the “Parts (T)” menu and then the “Edit Attribute” sub-menu displays the dialog box shown above.

(1) Using the “Change Screen” operation mode

Select the “Change Screen” operation mode and specify the number of the screen to be changed. Then press the switch part to switch the screen to the specified screen. To return to the screen displayed just prior to the currently displayed screen, the “Return to Previous Screen” operation mode can be used.

In this case, the value of the third word in the basic communication area / word device (the number of the currently displayed screen) changes to that of the new screen number, but please be aware that the contents of the first word (the screen number specified by the PLC) do not change. For detailed information, see page 65.

(2) Using the “Value Set” operation mode

Select the “Value Set” operation mode and enter the following settings:

- Data format: Specify 1 word
- Output destination: Specify to first word of basic communication area / word device
- Value: Number of screen to be changed to (hexadecimal specification)

Each time the GT main unit switch part is pressed, the screen number is forcibly written by the GT main unit to the first word of the basic communication area / word device, and the screen is switched.

If using this method, the values for both the first word of the basic communication area / word device (the screen number specified by the PLC) and the third word (the number of the currently displayed screen) are changed.

Using the auto-paging function

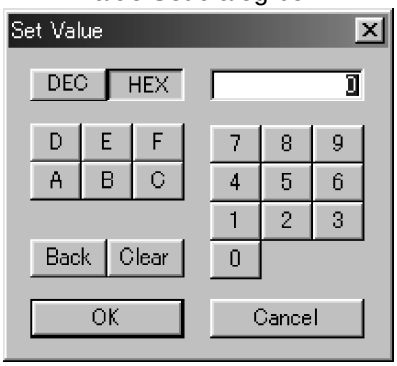
The GT main unit has an “Auto-paging” function that automatically switches the screen to a specified screen number when a certain period of time has elapsed. This function can be used to switch screens automatically.

For information on setting the auto-paging function, please see page 47 (GT01).

If using this function, please be aware that the value of the third word in the basic communication area / word device (the number of the currently displayed screen) changes to that of the new screen number, but the contents of the first word (the screen number specified by the PLC) do not change. For detailed information, see page 65.

Clicking on the [...] button displays the value setting dialog box shown below. Specify the number of the screen to which the display is to be changed.

Value Set dialog box



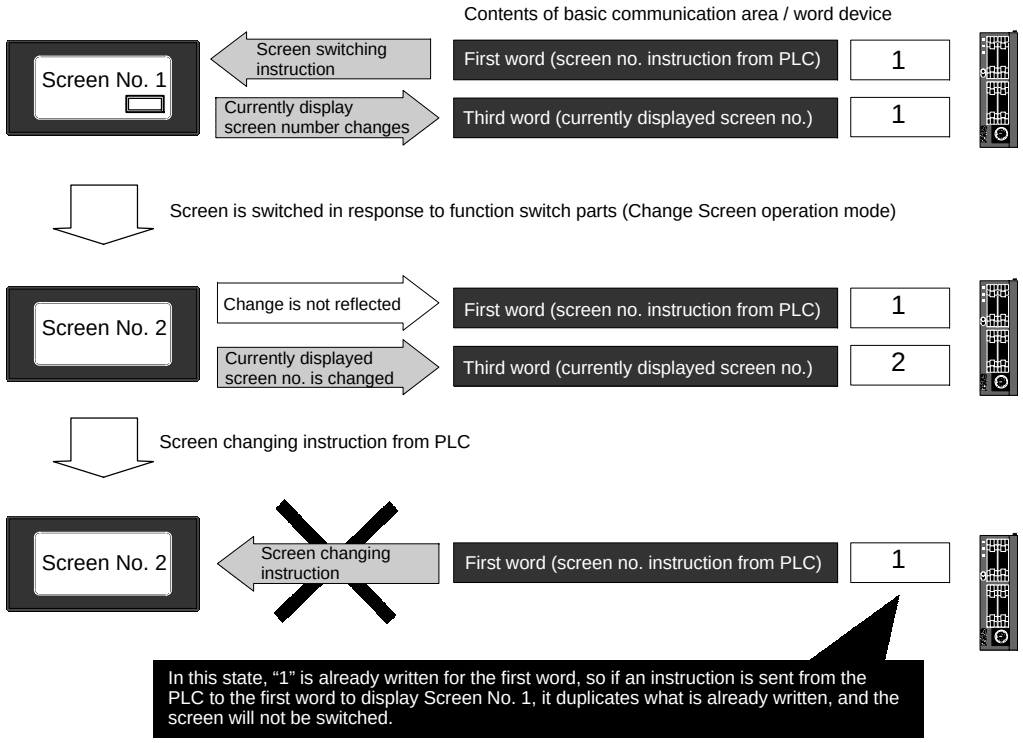
If the value is entered with the HEX button pressed as shown at the left, a hexadecimal screen number is specified, and if the value is entered with the DEC button pressed, a decimal value is entered.

The Back button acts as a backspace key when entering an address, and the Clear button functions as a Clear key.

◆ Key points

- **If the screen does not change as expected**
  If the screen is changed from the PLC, and the GT main unit function switch parts are also used to change the screen (Change Screen operation mode), a case sometimes occurs in which the screen does not change, even though an instruction to change the screen has been issued by the PLC.

Example: Screen No. 1 is displayed in keeping with the instruction from the PLC, and the screen is changed to Screen No. 2 using the function switch parts.


Contents of basic communication area / word device
Screen No. 1
Screen switching instruction
Currently display screen number changes
First word (screen no. instruction from PLC)
1
Third word (currently displayed screen no.)
1
Screen is switched in response to function switch parts (Change Screen operation mode)
Screen No. 2
Change is not reflected
Currently displayed screen no. is changed
First word (screen no. instruction from PLC)
1
Third word (currently displayed screen no.)
2
Screen changing instruction from PLC
Screen No. 2
Screen changing instruction
First word (screen no. instruction from PLC)
1
In this state, “1” is already written for the first word, so if an instruction is sent from the PLC to the first word to display Screen No. 1, it duplicates what is already written, and the screen will not be switched.

This problem can be solved in the following manner:

- **Use the “forced-display flag” in the basic communication area/bit device.**

1) **At the same time that the PLC issues an instruction to change the screen again to Screen No. 1, or shortly after that point, the forced-display flag in the first word/Bit E of the basic communication area/bit device is turned on, using the bit as a PLC bit operation instruction.**
2) **When the forced-display flag begins to go on, the screen corresponding to the number written to the first word of the basic communication area/word device, meaning Screen No. 1, is forcibly displayed at the point that step 1 takes place. (This is carried out only at the rise of the forced-display flag).**
3) **After the screen has been switched, the forced-display flag should be turned off.**

- **Set the operation mode of the function switch parts to “Value Set”.**
  When the screen is switched using the function switch parts, as shown in the illustration above, the operation mode of the function switch parts is set to “Value Set” in order to switch the screen. (For detailed information, see page 62.)
  Using the “Value Set” mode changes the contents of the first word in the basic communication area/word device (the screen number specified by the PLC) and the third word (the number of the currently displayed screen) to that of the new screen number, and thus avoids the kind of case described above.

6.2 Basic Communication Area to PLC and Bit Device Functions (GT01)

6.2.1 Bit Device Functions

In order for communication to be carried out between the GT01 and PLC, an internal device area like that shown below is provided in the PLC. This basic communication area contains two types of devices: word devices, which are used to handle screen numbers and other data, and bit devices, which are used for bit information. The various bits of the bit devices are turned on and off from the PLC, and can be used to control various GT01 operations.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced-display flag	Backlight Valid flag	Backlight Flashing	Backlight Color											
N+1	Usage prohibited															
N+2																Data Input In Progress flag

Explanation of system areas

BZ - - - This turns on the buzzer.
Forced-Display flag - - - At the rise when the bit is turned on, the screen specified by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)
Backlight Valid flag - - - When the bit is turned on, the backlight flashing/backlight color control becomes effective.
Backlight Flashing - - - 0: Lighted (normal), 1: Flashing
Backlight Color - - - 00: Off, 01: Green, 10: Red, 11: Orange
Data Input In Progress flag - - - This is 1 while data is being input, and 0 when data input has been completed.

◆ **Explanation of this function**

DT0 to DT2 and WR0 to WR2 are set as the default values for the basic communication area.
For information on the contents of all areas of the basic communication area, please see page 26.

Changing the backlight color

Bits A and B of the first word of the bit device are used to change the backlight color. The color of the backlight can be changed by turning these bits on and off. To make these settings valid, however, Bit D (Backlight Valid flag) must always be turned on at the same time.

Bit status		Backlight color
B	A	
OFF	OFF	Off
OFF	ON	Green
ON	OFF	Red
ON	ON	Orange

Using a flashing backlight

Bit C of the first word of the bit device is used to make the backlight flash. The backlight status can be changed by turning this bit on and off. To make this setting valid, however, Bit D (Backlight Valid flag) must always be turned on at the same time.

Bit status	Backlight status
C	
OFF	Lighted
ON	Flashing

Making the buzzer sound

Bit F of the first word of the bit device is used to make the buzzer sound. The buzzer status can be changed by turning this bit on and off.

Bit status	Buzzer status
F	
OFF	Stopped
ON	Buzzer output

Data Input in Progress flag

With the GT01, while data is being input from the screen keyboard part, Bit 0 of the third word of the bit device is on.
Applications should be set up so that, when this bit is on, the screen cannot be changed from the PLC.

Chapter 7

Servicing and Maintenance

7.1 Replacing the Front Panel Protective Sheet

7.1.1 About the Front Panel Protective Sheet

Protective sheets are available in order to protect the touch panel surface and to keep it clean. Please use the following separately-sold protective sheets if there is a possibility that the touch panel surface will become dirty.

Product name	Contents	Product number	
Front panel protective sheet	Front panel protective sheets for replacement (set of 10)	For GT01	AIGT080

7.1.2 Replacing the Front Panel Protective Sheet

Follow the steps below to replace the sheet:

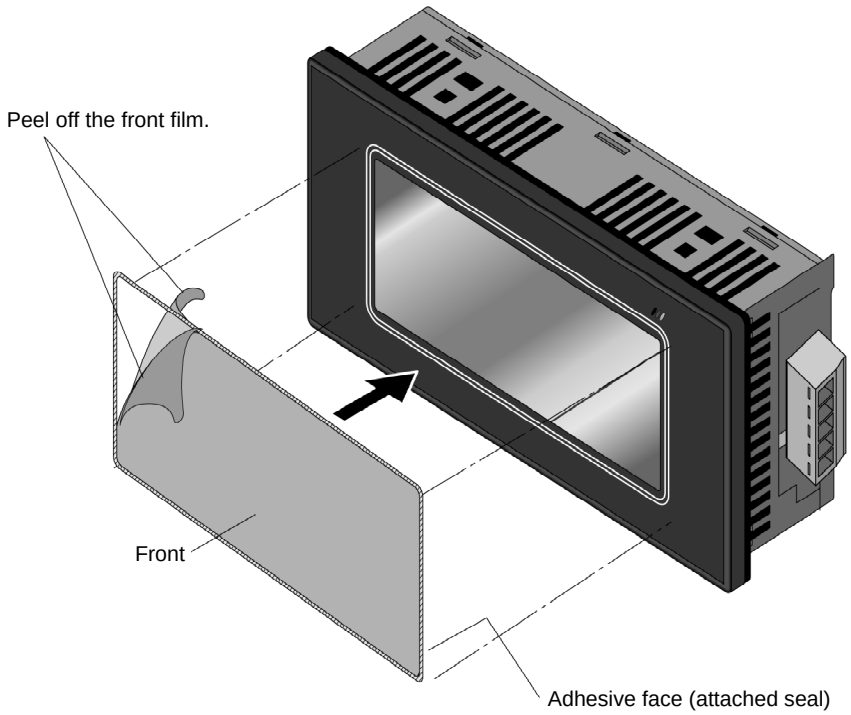
1. Remove the attached front panel protective sheet.

First, peel off the front panel protective sheet already attached to the GT main unit, starting from the knob is.

2. Peel off the seal from the provided protector sheet and attach it to the unit.

Take out one of the replacement front panel protective sheets and peel off the seal with the shiny side. When attaching the sheet, align the adhesive edges with the front of the GT main unit.

3. Finish by peeling off the thin film attached to the top of the front panel protective sheet.



7.2 Replacing the Waterproof Packing

7.2.1 About the Waterproof Packing

If the panel is being detached from the GT main unit and then reattached, the waterproof packing should be replaced, in order to assure that the panel remains waterproof (IP65).

Product name	Contents	Product number	
Waterproof packing	Waterproof packings for replacement (set of 10)	For GT01	AIGT081

7.2.2 Replacing the Waterproof Packing

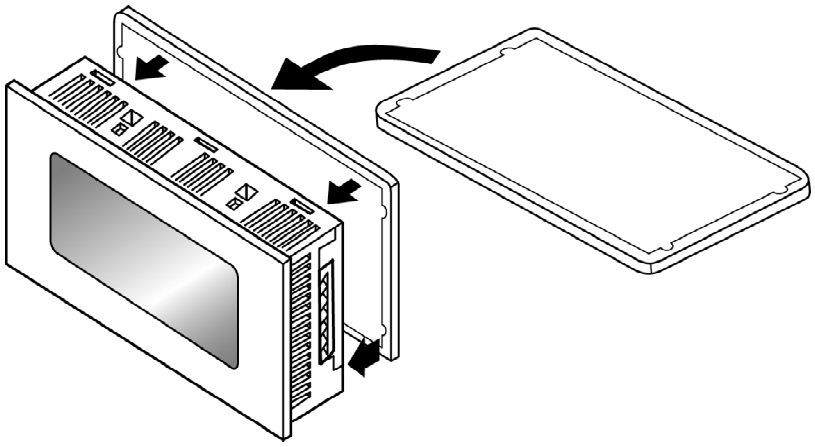
Follow the steps below to replace the packing:

1. Remove the currently attached waterproof packing.

Remove the attached waterproof packing from the GT main unit.

2. Attach the provided waterproof packing.

Take out one of the replacement waterproof packing pieces and attach the outer edge as shown in the illustration (do not use the inner edge).
When doing this, fasten it to the front frame, being sure not to twist the waterproof packing.



Chapter 8

Troubleshooting

8.1 What to Do If Something Unusual Occurs (GT01)

Problem	Cause	Solution	Related
Screen is blank	1) Power is not on. 2) (When only lamp and message parts are configured to the base screen) Value of substitute reference device value does not exist in substitute data.	1) Supply 5V DC power to unit. 2) Check the address of the substitute reference device and the device values on the PLC side.	P.16 GTWIN HELP
Error code [ER] appears at the top right of the screen**	An error has occurred in communication between the GT01 and an external device (e.g. PLC).	[Troubleshooting error codes] are listed on P.78. Refer to this section for details.	P.78
Screen displays [No Screen data]	There is no base screen data in the GT01. (Appears even when GT01 configuration data exists.)	Transfer base screen data from GTWIN.	GTWIN HELP
Screen displays [Screen No. Error]	1) Screen settings from the PLC, the GT01's switch part or the auto-paging indicate an unregistered screen number. 2) When bringing up the keyboard screen during data input, an unregistered keyboard screen number was specified. 3) GT01 configuration data and keyboard screen data exist in the GT01, but there is no base screen data.	1) Create and register screen content or specify the correct screen number. 2) Create and register keyboard screen or specify the correct keyboard number. 3) Transfer base screen data from GTWIN.	P.64 GTWIN HELP GTWIN HELP
Screen displays [Memory is Full]	The total capacity of transferred base screen data exceeds the 384kbyte capacity of the GT01.	Delete part of the base screen data so that the total capacity doesn't exceed 384kbyte. Data capacity can be checked by going to [View (V)] → [Memory Usage Conditions] on GTWIN menu bar.	GTWIN HELP
An unspecified screen appeared / there is trouble when switching screens	1) The screen specification in the PLC screen setting, the GT01 switch part or the auto-paging is wrong. 2) The startup screen is specified in the GT01 configuration settings (GTWIN). 3) An erroneous device or value is specified in the first word of the basic communication area word device.	1) Specify the correct screen number. 2) Check the start-up screen setting for the GT01 configuration settings in GTWIN. Delete unnecessary settings and re-transfer configuration data. 3) Check the device content specified on the PLC side in the first word of the basic communication area. (Do not use the basic communication area with ladder programs.)	P.64 P.46 P.24 to P.26
Screen doesn't switch	1) No screen number has been written to the screen setting area (the first word in the basic communication area word device) from the PLC. 2) The screen number to which you are attempting to switch has already been written from the PLC to the screen setting area (the first word in the basic communication area word device).	1) Specify correct screen number. 2) Refer to P.65 [If the screen does not change as expected]. (Do not use the basic communication area with ladder programs.)	P.64 P.65

8.1 What to Do If Something Unusual Occurs (GT01)

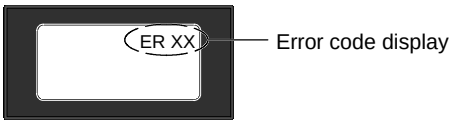
Problem	Cause	Solution	Related
Screen is dim	1) The power voltage may be low. 2) The contrast is set too low. 3) The backlight is off due to the [Backlight Auto-off] setting in the [Setup] of the GT01 configuration settings in GTWIN.	1) Supply 5V DC 0.2 A. 2) Bring up the system menu and adjust the contrast. 3) Touching any area of the screen lights that area. If a switch part is set on the touched area, the area will not light even if touched. To change the setting, change the content of the backlight auto-off settings.	P.16 P.55 P.51
Backlight goes off too quickly	The backlight auto-off timer setting is too short.	Change the backlight auto-off timer setting.	P.51
Date / time display is incorrect	1) The PLC's internal calendar timer used as a reference is incorrect.	1) Adjust by rewriting the value in the PLC's internal calendar timer.	All PLC manuals
Touch panel doesn't work	1) Valid conditions have been set for the switch part, but those conditions have not been met. (Applies only to custom parts.)	1) Check that the device status conditions on the PLC side are valid.	GTWIN HELP
No operating sounds are heard when the touch panel is pressed.	1) The [Switch Sounds] setting under [Options] in the switch part attributes is set to [Disabled]. 2) The [Touch Sounds] setting under [Setup] in the GT01 configuration settings in GTWIN is set to [Disabled].	1) Change the setting to [Enabled]. 2) Change the setting to [Enabled].	GTWIN HELP

Problem	Cause	Solution	Related
Buzzer sounds continuously	Bit F of the first word in the basic communication area bit device is set to ON.	Set the F bit to OFF on the PLC side. (Do not use the basic communication area with ladder programs.)	P.67 to P.68
Backlight color changes / flashes	Bits A and B, and Bit D, of the first word (backlight color setting) in the basic communication area bit device are set to ON. Or, Bits C and D (backlight flashing setting) are set to ON.	Perform correct bit operations on the PLC side. (Do not use the basic communication area with ladder programs.)	P.67 to P.68
Cannot transfer data from GTWIN	1) The screen transfer cable is not connected. 2) The PC and GT01 COM. port are connected.	1) Confirm that the screen transfer cable is correctly and firmly connected. 2) Connect to TOOL port with screen transfer cable.	GTWIN HELP
*** Screen is blank (power supply and substitution settings above are correct)** *** An incorrect screen is displayed (error codes and erroneous date and time items noted above do not apply)** *** Switch doesn't work (grid and validity settings noted above are correct)**	An error has occurred in the GT01 system.	1) After confirming the safety of the device, etc., turn off the power supply and then turn it on again. The GT01 CPU will be reset. 2) If 1) produces no change, bring up the system menu and initialize the memory (F-ROM), then transfer data again from GTWIN to the GT01. CAUTION: When doing this, all base screen data, GT01 setting data, keyboard screen data, and bitmap data will be lost. Before doing this, make sure all data has been backed up. 3) If 2) produces no change, set the operating mode setting switches 2, 3 and 4 on the rear of the GT01 to ON and reset the power supply. CAUTION: When doing this, all of the contents will revert to those in effect at the time of shipping, and all of the GT01 memory contents will be cleared. Before doing this, make sure all data has been backed up.	P.56

8.2 Error Codes and How to Handle Them

8.2.1 About Error Codes

When an error occurs in the GT series, an error code displays at the top right of the screen. There are two types of error codes, GT series error codes and PLC error codes.



8.2.2 GT Series Error Codes

When connected to a FP series PLC

The following three types of error codes are displayed when there is an error in the GT main unit:

Code no.	Content	Cause and solution
FF	Time up error No response from the PLC.	1) The PLC connection cable is disconnected. Check the connection cable to make sure it is connected. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT main unit.
21	Data error A data error occurred during communication.	1) An error exists in the communication condition settings. Check the PLC and GT main unit communication speed and transfer format. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT main unit.
22	Overrun error The GT main unit cannot receive data.	The reception buffer in the GT main unit is overflowing. There could be an error in the PLC. Re-supply power to the PLC and GT main unit.

8.2.3 PLC Error Codes

Error codes which are sent from the PLC are listed in the table below. For details, please refer to the separate [Computer Communication Unit Introductory Manual].

Code no.	Content	Cause and solution
21	Data error A data error occurred during communication.	1) There is an error in the communication condition settings. Check the PLC and GT01 communication speed and transfer format. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT01.
22	Overrun error The PLC isn't receiving data.	The CPU unit's reception buffer is overflowing. There could be an error in the PLC. Re-supply power to the PLC and GT01.
40	BCC error A data error occurred during communication.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT01. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT01.
41	Format error The PLC has been sent a command that doesn't match the protocol.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT01. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT01.
42	NOT support error The GT01 has sent a non-supported command to the PLC.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT01. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT01.
53	BUSY error The PLC is currently processing another command.	A large amount of data is being communicated with another RS232C port on the PLC. Wait until the error is gone.
61	Data run error There is an error in the register or relay number.	A register or relay number which doesn't exist in the PLC was specified during screen creation using GTWIN. Correct the output device being used with the part, or the transfer of clock data to an external device.

8.3 Table of Screen Messages

8.3.1 Table of GT01 Screen Messages

In addition to screen data, the GT01 also displays the following messages.

When transferring data from personal computer to a GT01

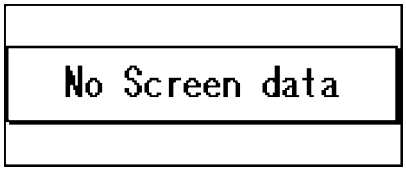
This is displayed when data is being transferred from the computer to the GT01.

When transferring data from GT01 to a personal computer

This is displayed when data is being transferred from the GT01 to the computer.

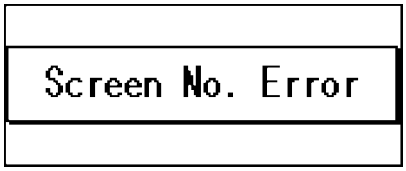
When there is no base screen data

This is displayed when there is no base screen data. (It is displayed even if the configuration data has been sent.)



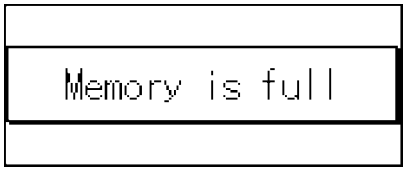
When the specified screen does not exist

This is displayed in cases such as when there is no data for a specified screen number.



When the screen memory is full

This is displayed if the internal user memory (F-ROM) is full.



Appendix

Information

A.1 BIN/HEX/BCD Code Correspondence Table

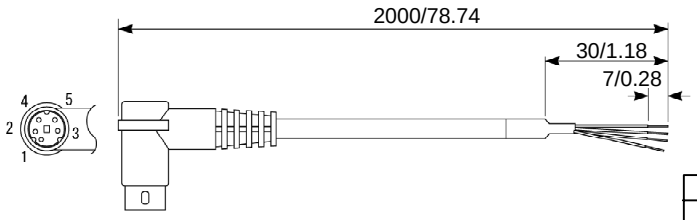
Decimal	Hexadecimal	Binary	BCD code
0	0000	00000000 00000000	0000 0000 0000 0000
1	0001	00000000 00000001	0000 0000 0000 0001
2	0002	00000000 00000010	0000 0000 0000 0010
3	0003	00000000 00000011	0000 0000 0000 0011
4	0004	00000000 00000100	0000 0000 0000 0100
5	0005	00000000 00000101	0000 0000 0000 0101
6	0006	00000000 00000110	0000 0000 0000 0110
7	0007	00000000 00000111	0000 0000 0000 0111
8	0008	00000000 00001000	0000 0000 0000 1000
9	0009	00000000 00001001	0000 0000 0000 1001
10	000A	00000000 00001010	0000 0000 0001 0000
11	000B	00000000 00001011	0000 0000 0001 0001
12	000C	00000000 00001100	0000 0000 0001 0010
13	000D	00000000 00001101	0000 0000 0001 0011
14	000E	00000000 00001110	0000 0000 0001 0100
15	000F	00000000 00001111	0000 0000 0001 0101
16	0010	00000000 00010000	0000 0000 0001 0110
17	0011	00000000 00010001	0000 0000 0001 0111
18	0012	00000000 00010010	0000 0000 0001 1000
19	0013	00000000 00010011	0000 0000 0001 1001
20	0014	00000000 00010100	0000 0000 0010 0000
21	0015	00000000 00010101	0000 0000 0010 0001
22	0016	00000000 00010110	0000 0000 0010 0010
23	0017	00000000 00010111	0000 0000 0010 0011
24	0018	00000000 00011000	0000 0000 0010 0100
25	0019	00000000 00011001	0000 0000 0010 0101
26	001A	00000000 00011010	0000 0000 0010 0110
27	001B	00000000 00011011	0000 0000 0010 0111
28	001C	00000000 00011100	0000 0000 0010 1000
29	001D	00000000 00011101	0000 0000 0010 1001
30	001E	00000000 00011110	0000 0000 0011 0000
31	001F	00000000 00011111	0000 0000 0011 0001
63	003F	00000000 00111111	0000 0000 0110 0011
:	:	:	:
255	00FF	00000000 11111111	0000 0010 0101 0101
:	:	:	:
9999	270F	00100111 00001111	1001 1001 1001 1001

A.2 ASCII Code Table

b7	b_6	b_5	b_4	b_3	b_2	b_1	b_0	ASCII HEX code		Most significant digit 0	1	2	3	4	5	6	7
								b7									
								b_6		0	0	0	0	1	1	1	1
								b_5		0	0	1	1	0	0	1	1
								b_4		0	1	0	1	0	1	0	1
				0	0	0	0	Least significant digit	0	NUL	DEL	SPACE	0	@	P	‘	p
				0	0	0	1		1	SOH	DC_1	!	1	A	Q	a	q
				0	0	1	0		2	STX	DC_2	”	2	B	R	b	r
				0	0	1	1		3	ETX	DC_3	#	3	C	S	c	s
				0	1	0	0		4	EOT	DC_4	$	4	D	T	d	t
				0	1	0	1		5	ENQ	NAK	%	5	E	U	e	u
				0	1	1	0		6	ACK	SYN	&	6	F	V	f	v
				0	1	1	1		7	BEL	ETB	’	7	G	W	g	w
				1	0	0	0		8	BS	CAN	(	8	H	X	h	x
				1	0	0	1		9	HT	EM	)	9	I	Y	i	y
				1	0	1	0		A	LF	SUB	*	:	J	Z	j	z
				1	0	1	1		B	VT	ESC	+	;	K	[	k	{
				1	1	0	0		C	FF	FS	,	<	L	¥	l	|
				1	1	0	1		D	CR	GS	-	=	M	]	m	}
				1	1	1	0		E	SO	RS	.	>	N	^	n	~
				1	1	1	1		F	SI	US	/	?	O	_	o	DEL

A.3 Cable Specifications

A.3.1 PLC Communication Cable: Mini-DIN 5-pin Loose-Wire (AIGT8142)



Mini-DIN plug side signals

Pin no.	Abbreviation	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	- -	- -
5	+5V	White

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m/6.56 ft	AIGT8142

A.3 Cable Specifications

Record of changes

Manual No.	Date	Description of Changes
ARCT1F381E	APR. 2003	First edition